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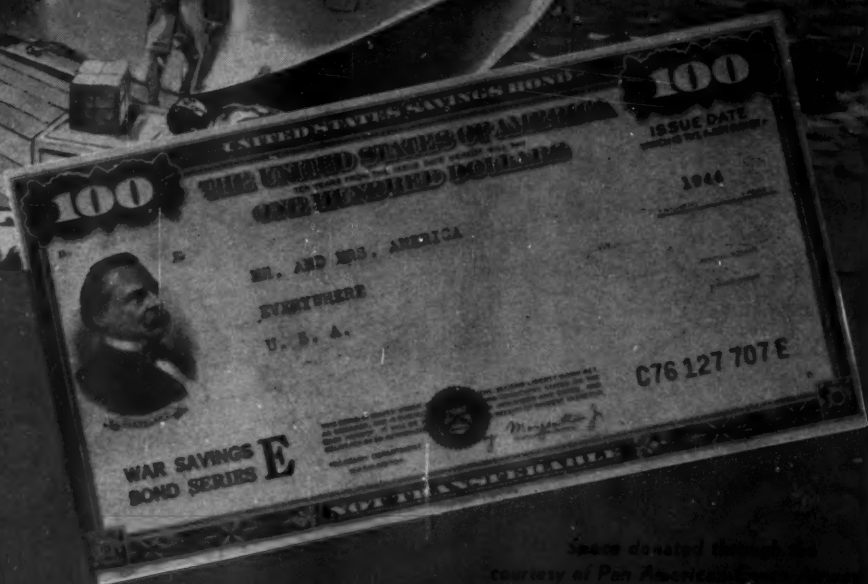
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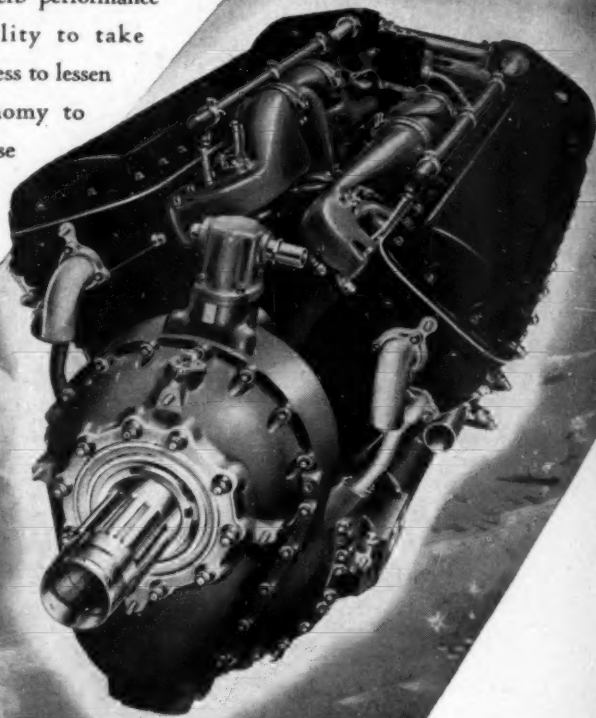


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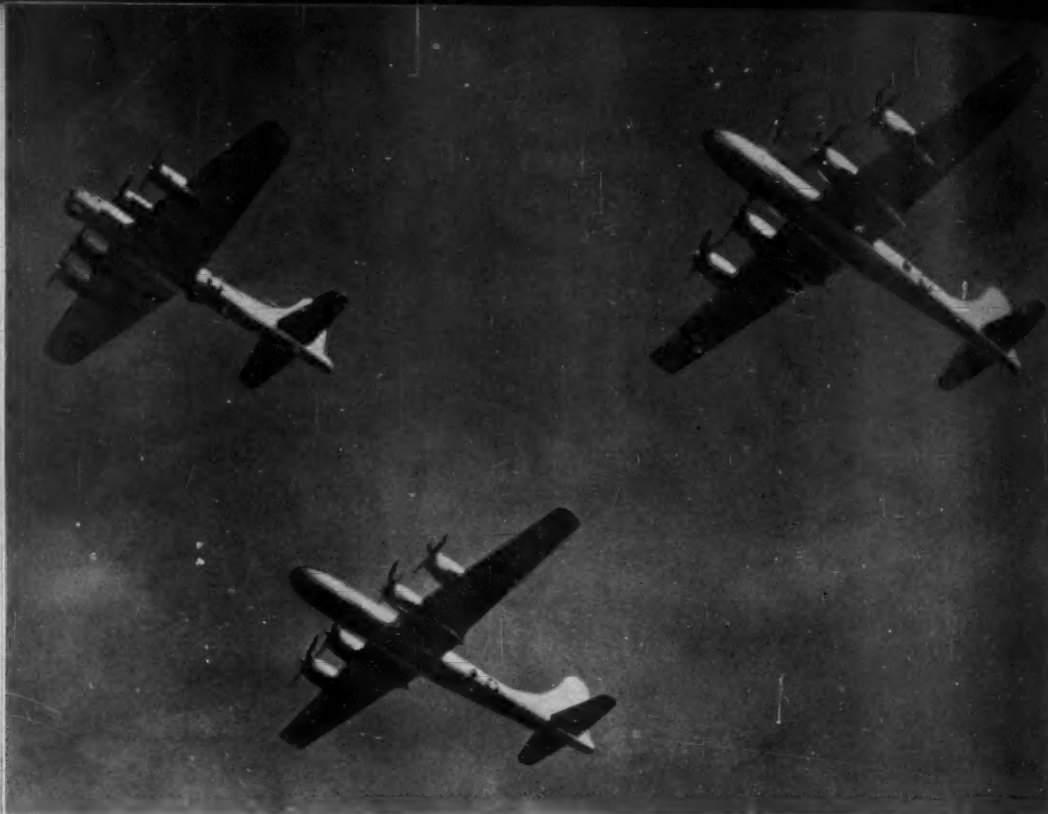
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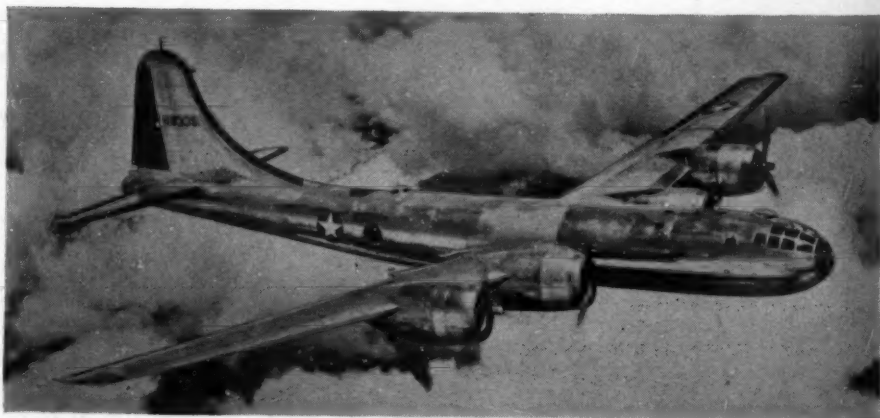
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Above — The B-17G, a Boeing flying fortress flies in formation with two B-29 Superfortresses, the new stratosphere bomber that has just completed a successful raid over the Japanese homeland. The Superfortress, half again as large as the flying fortress has the speed of a pursuit plane.

Below — America's new Superfortress as it appears in the first photograph to be released for publication. General Henry H. Arnold calls this battleship of the skies far ahead of present-day heavy bombers. The new Superfortress bombed Japanese steel works recently in its wartime debut.



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THE COVER—War Bonds will buy more and more warloads for the mighty Martin Mars. (Drawing courtesy of Curtiss-Wright Corporation, Propeller Division.)

JOHN F. BUDD, Editor and Publisher

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Publishers of CUSTOM HOUSE GUIDE
and AMERICAN
IMPORT & EXPORT BULLETIN

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Post-War Round World Routes Mapped By C.A.B. Total 140,000 Air Miles

"Basic Draft" of Operations Proposed For Nation Despite Lack of Exact Foreign Policy

SOME indication of what the United States intends to do in the sphere of international commercial air operations after the war has been given in Washington by the Civil Aeronautics Board through its chairman, L. Welch Pogue, who announced that the 80,000 route miles already approved for overseas air transportation would be expanded to a total of 140,000 miles of airlines to come under American operation.

Although Chairman Pogue was careful to point out that the plan was elastic and characterized it as "a first basic draft," the announcement of the proposed world air routes was regarded by many in the nation's capital as a step toward at least partial clarification of the confusion that has clouded the government's foreign air policy. The confusion, it was said, is now several years old, and may be attributable to the failure of the executive branch of the government to state an exact foreign policy based on existing legislation, or of Congress to clarify the situation with a new law.

Chairman Pogue emphasized the board's inability to wait any longer for some clarification of the national policy, declaring that it would have to proceed under the present law if it is to be ready with approved lines when the war ends. The route plans, he said, were prepared with the benefit of more than 100 applications, but without any thought of designating a specific carrier for the operation of any particular route.

The scope of the proposed services, which the members of the board tentatively decided would be desirable for operation by the United States, is vast, in spite of the fact that services from the United States and Alaska terminating in adjacent

Canada and Mexico as well as the services begun in support of the war effort under temporary certificates, were omitted.

Foreign governments were apprised of the board's conclusions by the State Department. Interpretations of the present law, it was understood, tend toward providing for competitive private operation on some foreign routes, as across the Atlantic, but they also require the board to decide each case on its individual merits.

According to Chairman Pogue, members of the board will begin immediately to act on the applications in which operators and future would-be operators seek certificates for foreign operations. The law provides that the board's decisions on foreign routes must be approved by the President.

The plans announced by the board appear to oppose the goal of the bill introduced in Congress which calls for a government-directed single airline for foreign operations in which all of the domestic lines would own stock. Thus far, however, Congress has not altered the existing law under which the board is believed to enjoy wide latitude in determining whether operations shall be competitive. Acquisition for foreign landing rights, believed a necessity for the proper functioning of the routes planned, will have

to come from inter-governmental negotiations, it was said.

A list of the routes proposed by the Civil Aeronautics Board for commercial operation after the war follows:

- I. NEW YORK—a point in Newfoundland or Labrador—a point in Eire-London-Berlin-Prague-Vienna-Istanbul-Cairo.
- II. NEW YORK—a point in Newfoundland or Labrador—a point in Eire-Paris—a point in Switzerland-Rome-Athens-Cairo-Basra-Karachi-Calcutta.
- III. NEW YORK—points in Newfoundland or Labrador, Greenland and Iceland-Oslo-Stockholm - Helsinki - Leningrad - Moscow - Teheran-Basra.
- IV. NEW YORK-Bermuda-Azores-Lisbon.
 - (a) Lisbon-Madrid-Marseille-Rome.
 - (b) Lisbon-Algiers-Tunis-Tripoli-Cairo.
 - (c) Lisbon-London.
- V. NEW YORK-San Juan-Trinidad-Paramaribo-Belem-Natal.
 - (a) Natal - Dakar - Casablanca-Tangier-Madrid-Paris.
 - (b) Natal-Dakar-Monrovia-Lagos or Accra - Brazzaville-Johannesburg-Cape Town. As alternate on express trips, the route would be via Natal-Ascension Island-Lagos-Accra—or Point-Noire.
- VI. SAN FRANCISCO-Los Angeles-Honolulu-Canton Island-Suva-Noumea:
 - (a) Noumea-Auckland.
 - (b) Noumea-Sydney.

From West Coast and Chicago

- VII. SAN FRANCISCO - Honolulu - Midway - Wake:
 - (1) Wake-Tokyo-Shanghai.
 - (2) Wake-Guam-Manila.
 - (a) Manila-Macao-Hong Kong (or Canton).
 - (b) Manila-Tarakan-Singapore-Batavia.
- VIII. CHICAGO-St. Paul-Minneapolis-Alaska, and Seattle-Alaska: At least one of these routes to be extended beyond Alaska to:
 - (a) Alaska—One or more intermedi-

- ate points in Siberia-Vladivostok-Mukden-Shanghai-Hong Kong (or Canton)-Hanoi-Calcutta.
 - (b) A leg from Mukden to Peiping and Chungking.
 - (c) Alaska-Unalaska-Kiska-Paramushiru-Tokyo-Shanghai-Hong Kong (or Canton).
- IX. MIAMI-San Juan-Trinidad-Belem:
 1. Belem-Fortaleza-Natal-Recife-Vitoria-Rio de Janeiro.
 2. Belem-Barreiras-Rio de Janeiro:
 - (a) Rio de Janeiro-Porto Alegre-Montevidéo-Buenos Aires.
 - (b) Rio de Janeiro-Sao Paulo-Asuncion-Buenos Aires.
 - X. MIAMI-Havana-Merida.
 - XI. MIAMI-Cienfuegos-Kingston.
 - (a) Kingston-Cristobal.
 - (b) Kingston-Barranquilla.
 - XII. MIAMI-Nassau.

From Gulf Terminals

- XIII. NEW ORLEANS-Merida-Guatemala City.
- XIV. BROWNSVILLE-Mexico City-Guatemala City-San Salvador-Tegucigalpa-Managua-San Jose-Balboa-Cristobal.
 - (a) Cristobal - Barranquilla - La Guaira-Trinidad.
 - (b) Cristobal-Medallin.
- XV. CRISTOBAL-Cali-Guayaquil-Lima-Arica:
 - (a) Arica-La Paz-Buenos Aires.
 - (b) Arica-Santiago-Buenos Aires.
 - (c) Arica - Antofagasta - Salta - Buenos Aires, and certain connecting services.
- XVI. NEW YORK—a point in southeastern United States—Ciudad Trujillo or Port-au-Prince-Cargacas-Manaos:
 - (a) Manaos-Golanla-Bello Horizonte-Rio de Janeiro.
 - (b) Manaos - Cuyab-Corumba-Asuncion-Buenos Aires-Montevidéo.
- XVII. NEW ORLEANS-Havana-Santiago-Port-au-Prince, Ciudad Trujillo-San Juan.
- XVIII. TAMPA-Havana.
- XIX. BALBOA-Cali-Iquitos-La Paz-Buenos Aires.
- XX. NEW YORK-Charleston-Nassau—a point or points in Cuba-Kingston-Balboa (or Cristobal).

Arctic Air Routes In Post-War Air Age To Shorten Global Flights

Wartime aeronautic engineering developments, already earmarked for post-war commercial use, will enable planes to fly new routes across Arctic wastes and thus shorten global and intercity flights by hours, days and even weeks. This prediction was made by aeronautical engineers at the National Aeronautic Meeting of the Society of Automotive Engineers held recently in New York.

Engineers, who now are working to supply the military with planes which operate satisfactorily in extreme sub-zero temperatures, envision post-war air transportation routes between the world's great cities via the Arctic. Planes operating in temperatures down to 60 degrees below zero Fahrenheit, they explain, can clip hours and days from present land travel time.

George A. Bleye of the Wright Aeronauti-

cal Corporation described a North Pole route which shortens by 4,000 miles the New York to Chungking flight. New York to Manila flights, he said, can be cut 2,000 miles by routing the plane through Fairbanks, Alaska; while 1,000 miles can be saved in a flight from New York to Moscow by flying across Northern Ireland.

J. E. Gulick of the B. F. Goodrich Company disclosed that many hazards caused by the formation of ice on planes flying the Atlantic had been overcome by the development of de-icers for the wings, and slinger rings and feed shoes for the propellers. He added, however, that the aviation industry had not yet produced a "complete cure-all" for the aircraft icing problem.

Other speakers at the meeting called for simplicity of construction and of operation, reliability and lighter weights in the designing and building of aircraft; decried the theory of applying automobile mass production methods to aircraft construction; and urged improvements in the design of small parts.



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WILL SPEED COMMERCE

New Hemisphere Airports Unite Americas Through Air-Borne Exchanges

Present and Post-War Trends In Airport Expansion Forecast Growth of Latin American Aviation

By NORRIS M. MUMPER

Director of Aviation, Office of Inter-American Affairs

SCORES of airports and landing fields have been constructed in the Americas in recent months, despite many wartime obstacles. There is little doubt, moreover, that the airport construction program that we see going on in the United States and the twenty other American republics will be continued as a result of the demands of post-war expansion of commercial aviation.

It is a truism that expansion of aviation and airport facilities proceed together. This has been demonstrated in the rapid development of commercial aviation in the Western Hemisphere since the outbreak of war. With the expansion of commercial aviation in the post-war period, which some estimates place as high as at least three times the present service, many new airports will be needed.

The new airports are bound to play an important role in bringing about closer economic, political and spiritual relations among the Americas. Already airports have proven themselves to be stepping-stones to greater inter-American unity.

There is no way, of course, of knowing exactly how great the post-war development of airports is likely to be, but some idea can be gained by present and post-war trends that are already evident. For example, airport facilities that have taken place here since the outbreak of war also give reason for believing that existing United States airport facilities may possibly be doubled in the post-war period.

In the United States, with the completion of more than 550 airport develop-

ment projects undertaken by the Civil Aeronautics Administration at a cost of \$400,000,000, there will be, at the close of 1944, more than 3,000 civil airports, of which 940 will be class III or better—that is, suitable for scheduled air carrier transport.

But because of the anticipated post-war expansion of aviation in the United States, the Civil Aeronautics Administration has recommended that the United States' goal of 4,000 airports, which was originally projected in 1939, now be raised to a post-war goal of 6,000 airports, within five years after hostilities cease. This proposed post-war program will cost approximately \$800,000,000. Such an expenditure would mean doubling the present airport investment in this country.

Record-Breaking Expansion

Latin America has similarly undergone rapid airport expansion since the war began. In the 20 other American republics, at the close of 1944, there will probably be more than 2,100 civil airports, of which between 300 to 400 will be class III or

better. Because expansion of airport facilities must go hand in hand with expansion of commercial aviation, the other Americas will obviously experience airport expansion of record-breaking proportions in the post-war period.

News reports of aviation and airport developments "south of the border" illustrate how present and future airport trends in the United States are duplicated in the other Americas. In Peru, for instance, President Manuel Prado, in order to prepare for the post-war aviation expansion anticipated in his country, recently decreed the formation of the Peruvian Airport and Commercial Aviation Corporation (CORPAC), a corporation owned entirely by the Peruvian Government, which will have an initial capital of \$1,538,000 (10,000,000 soles). The charter gives this new agency wide powers to organize and manage airports. Projected improvements for the airport at Lima will cost \$183,000 (1,200,000 soles). In the neighboring Republic of Chile, President Juan Antonio Rios is reported by the Chilean radio to have signed appropriations of \$646,000 (20,000,000 pesos) to be used, in part, for the construction of a network of air fields throughout the nation. In Brazil, Air Minister Joaquin Pedro Salgado, jr., is reported to have told the press that several large airfields, capable of accommodating large cargo planes, and also a pilot training school would be built in the State of Rio Grande do Sul.

In Nicaragua airline facilities were increased substantially during 1943 with the completion of the modern Las Mercedes Airport, the second airport near Managua, and the inauguration of two new lines—one, a common carrier, to New Orleans, Louisiana, from Balboa, via Guatemala City and Merida, and the other, a charter service, to Miami, Florida, from San Jose, Costa Rica, via Tegucigalpa and San Salvador. In recent years, especially during 1943, airports have been built in the remote jungles of eastern Nicaragua, making possible the shipment of machinery to the gold mines and the transportation of men, supplies and foodstuffs to the rubber-tapping areas. These airports made possible the necessary quick shipment of highly perishable Hevea rubber seedlings and budwood of high-yielding clones, cinchona seedlings, derris cuttings, and other strategic plant stock isolated areas.

Without the aid of airways, establishment of these complementary agricultural crops in eastern Nicaragua would have been impossible, the Department of Commerce reports.

In Paraguay, Panair do Brasil's new airfield at Campo Grande, near Asuncion, the capital, was opened in April. In Ecuador the airport-extension project at Guayaquil has been completed. According to the Ecuadoran Foreign Office bulletin, Ecuador plans to construct a network of airfields near its principal cities that will in the future facilitate national air transportation.

Mexico, which has a splendid modern airport at Monterrey, will have two new ones soon—at Nuevo Laredo, across the border from Laredo, Texas, and at Mexico City. The airport at Mexico City, an expansion of the present Aeropuerto Central, will boast five main runways ranging in length from 5,740 feet to 8,200 feet, and several smaller runways, according to the Mexican press. The area of the field will be almost twice as large as that of New York's famed LaGuardia Field. Its passenger terminal will be capable of accommodating 1,800 persons at one time.

Mexico also furnishes a striking example of how commercial air service has expanded in Latin America, as it also has in the United States, despite wartime shortages of planes, equipment, and manpower.

Growth In Spite of Shortages

According to the U. S. Office of Air Transport Information, the 13 domestic and international airlines operating as common carriers in Mexico as of March, 1944, had unduplicated route mileage more than 15 per cent greater than the unduplicated route mileage flown by 12 common carrier air transport companies in March, 1943. Unduplicated route mileage of common carrier air-transport companies amounted to 19,222 miles in March, 1944, as compared with 16,664 miles in March, 1943. Of the 13 common carrier air transport companies operating in March, 1944, two were U. S.-flag carriers—Pan American Airways, Inc., with 1,743 unduplicated route miles, and American Airlines, Inc., with 1,521 unduplicated route miles, in Mexican services.

The size of the international passenger air traffic to Mexico in 1943 can be seen from the report of the Mexican Tourist Association (Association Mexicana de Truisme) that of the record total of 207,000 foreign visitors to Mexico last year, 37,000 of the 160,000 visitors not in transit came by plane, as compared with 35,000 by rail and 88,000 by road. Unlike Mexico, tourist travel by United States citizens elsewhere in Latin America is banned, but essential air travel on governmental and business matters between the Americas last year did, however, bring a gain in passenger traffic over previous years.

Although exact figures of the international passenger air traffic in the other Americas are not yet available, Panagra (Pan American-Grace Airways), which is one of the largest international airlines operating in South America, reported an increase of more than 21 per cent in passenger traffic in 1943 as compared with 1942 passenger traffic. Panagra announced that it carried 69,000 passengers as compared with 56,770 in 1942, that it flew 4,700,000 plane miles during the year as compared with 4,030,000 the year previous. Panagra's reported increase of more than 21 per cent in passenger air traffic is, incidentally, double the increase reported by the United States domestic air lines for 1943.

As for air freight, the Interdepartmental Air Cargo Priorities Committee, War Production Board, states that in the year 1943 the total movement of imported materials by air was 42,010,298 pounds, amounting to \$119,890,402 in dollar value, of which 5,429,522 pounds, having a dollar value of \$25,617,865, were flown to the United States from the 20 other American republics, including the Canal Zone. Most of these air shipments from Latin America consisted of vital war materials such as Brazilian quartz, mica, tantalite, beryllium, and crude rubber.

The foregoing are only a few of the developments in commercial aviation and airports reported recently by the press and radio, yet they afford sufficient evidence to identify the trends. There are important differences, however, between the aviation and airport outlook in the United States and the situation in most of Latin America that must be pointed out.

As William A. M. Burden, Assistant

Secretary of Commerce, has emphasized in his book, "The Struggle for Airways in Latin America," most of the other American republics have mountainous areas, jungles and arroyas which have long retarded adequate ground transportation by highways and railroads. As a result of this and other common features, there was a rapid and early growth of air transportation in almost all these countries.

"The important place which the airplane has already taken in transportation in Latin America," Mr. Burden explains, "is made clear by the fact that there are as many miles of airlines in the area as there are miles of railroad. In only seven of the 20 republics does railroad mileage exceed airline mileage. Two of the South American countries and every one of the Middle American countries, except Haiti and the Dominican Republic, have more airline mileage per thousand square miles than has the United States."

Mr. Burden then expresses the opinion

The Writer

A man of 50 who has spent half of his life in the East and half in the West, Mr. Mumper received his academic training at Dickinson College and post-graduate mechanical engineering training at Columbia University. He has traveled extensively, making five trips to Europe; four to the Orient and many to Latin America. In the first World War, he was Captain Adjutant, 309th Field Artillery, 78th Division, with one year's service in France and three stars on his service ribbon.

His experience in aviation began in 1938 as Latin American sales manager for Vultee, Stinson and Lycoming Motors. After spending a year south of the border, he moved to New York where he served as export sales manager for Vultee.

He entered the government service in 1941 with the American Republics Aviation Division of Defense Supplies Corporation, working with William A. M. Burden on the elimination of German airlines in South America. He was brought shortly thereafter to the Office of Inter-American Affairs as Director of Aviation, the position he now occupies. His duties in this position have kept him in constant touch with all phases of aviation throughout the other American republics.

that Latin America is extremely fortunate in being the first important continent where the air transport system is having a chance to develop unhampered by the existence of what he calls "giant obsolescent surface transport systems." Hence, he doubts if ground transport systems will be built on anything like the scale that they would have if Latin America had already placed huge investments in the older forms of transport.

Air Development Important

This novel dependence on air transport rather than railroads or highways in the interior will probably make the future development of local air transportation in some respects more important to Latin America than the growth of the international system which connects it with other continents.

A possible indication of post war developments elsewhere in Latin America is the unusual success that air cargo planes have already achieved in mountainous Central America. There, Transportes Aereos Centro-Americanos (TACA) and its affiliates are credited with having carried more air cargo than all the domestic United States airlines combined. In 1941, for example, TACA carried 30,161,000 pounds of express and freight compared with 11,160,000 unduplicated poundage carried by U. S. domestic air carriers. On the other hand, the average distance a shipment was carried in the United States exceeded 500 miles while on TACA the average distance was probably nearer 150 miles.

TACA's success lies principally in the hauling of bulk freight cheaply in regions where surface transportation is difficult. In fact, more than 60 per cent of its income in 1940 was derived from air freight, as compared with less than three per cent earned by U. S. domestic air carriers from the carriage of express during the same year.

TACA's revenue from mail was some five per cent of its total income that year and from passengers, 31 per cent. TACA's freight revenue for all types of merchandise has averaged three cents per pound. TACA does not report ton-mile figures, but representative air express and air freight tariffs on TACA's lines, reduced to a ton-mile basis, would be approximately as follows: Managua-Bluefields—

171 airline miles—air express, 98.3 U. S. cents per ton-mile; air freight, 49.2 U. S. cents per ton-mile.

Should similar air cargo service be developed elsewhere in Latin America in the postwar period, it would seem apparent that considerable expansion of airports and landing fields would be necessary to handle internal trade and trade with neighboring republics.

One new use of air cargo planes in the post-war period has been suggested in studies of the possibilities of air cargo shipments of fresh fruits and vegetables. These studies are being carried on by several United States Government agencies and private research organizations, including Wayne University, Detroit, under the Edward S. Evans Grant for Air Cargo Research. Papayas and figs, for example, can be picked only when they are tree-ripe. This has prevented their shipment by rail over any considerable distance. If it is found that cargo planes can transport these and other fresh vegetables at not unreasonable costs in the post-war period, here again there will be a new need for airports and landing fields in the fruit and vegetable areas of the Americas so that cargo planes can collect such shipments.

As for post-war markets in Latin America, many foreign traders believe prospects are bright for maintaining U. S. exports to and imports from the other Americas. They point out, for one thing, that Latin America is building up substantial reserves of purchasing power for post-war use as a result of a heavy surplus of exports. According to the National City Bank of New York, the other American republics, as a whole, have accumulated gold and foreign exchange, mostly U. S. dollars amounting to approximately \$3,000,000,000. The bulk of this backlog of buying power has accumulated during the war period when United States imports from Latin America have risen to the highest level since 1920 in dollar value.

Increases Anticipated

In the post-war period, greatly expanded shipments of air mail, air express and air freight are anticipated by many shipping specialists. Similarly, tourist and travel agencies expect greater air travel

by business men, salesmen, engineers, students and tourists.

The war has brought about the realization by the American peoples that the economies of the United States and most of the other American republics largely are complementary. We now know that inter-American cooperation, based on the concept of mutual aid for mutual benefit, has a solid economic base. The \$1,300,000,000 worth of imports the United States received from Latin America last year emphasized that.

The war also has stimulated the interest of the American peoples in each other. The number of United States citizens studying Spanish today is unprecedented. Similarly, the study of English in Latin America has reached new heights. Travel authorities believe this war-stimulated interest will be reflected in tourist travel after the war ends.

However, it would be well, in considering the post-war aviation outlook, to dismiss fantastic notions as to the size either of post-war transport planes or of airports.

Notwithstanding the comic strip and pictorial magazine super-liners," Charles I. Stanton, Administrator of the Civil Aeronautics Administration, cautioned recently, "the 20-to-60 passenger airplanes are going to be the backbone of domestic air transport systems for some years to come because they furnish long distance travel with inter-city bus schedule frequencies."

President Harold J. Roig of Pan American-Grace Airways has said that Panagra anticipates providing round-the-clock service on its Latin-American air routes after the war with 50-passenger Douglas DC-4s, powered with four engines and with a cruising speed of 220 miles an hour. Similarly, President W. A. Patterson of United Air Lines has predicted that his company will place in service 4-engined, 40 to 50-passenger, 250-mile-an-hour transports which will supplement the company's present twin-engined, 21-passenger transport planes. It would appear, then, that airplanes in the postwar period used on the inter-American routes will probably be of not more than 60-passenger capacity for some years, at least.

According to the airport classification standards of the Civil Aeronautics Administration, there will be, at the close of 1944, between 300 to 400 class III or be-

ter airports in the other American republics capable of handling the twin-engined, 21-passenger plane which is in general use on the Latin-American main air routes. Some of these airports—the exact number must be withheld for reasons of military security — already are in the class IV category, equipped to accommodate the largest planes now in use and those planned for the immediate future. Construction is now under way or planned to create more class IV airports.

Under the Civil Aeronautics Administration's airport standards, a class three airport has landing strips 3,500 to 4,500 feet in length at sea level, and is suited for the safe handling of present-day transport planes. Planes in this classification are represented approximately by those between 10,000 to 50,000 pounds gross weight, or by those having a wing loading (lbs./sq. ft.) times power loading (lbs./HP) of 230 and over. Approaches to such an airport should be clear within a glide path of 30-to-1 in the case of class three and also class four airports, except for instrument landing runways, for which the ratio should be 40-to-1 from a point 4,500 feet from the beginning of the runway.

Class III airports are recommended for important cities on feeder line airway systems and many intermediate points on the main line airways. General population range for such a port would be from 25,000 to several hundred thousand. On the other hand, the Civil Aeronautics Administration recommends that major industrial centers and important junction points or terminals on the airways systems have class four airports.

A class IV airport must have landing strips sufficiently long to give the safety that landing strips 4,500 feet or more in length would give at the altitude of sea level, for planes having a gross weight of 50,000 pounds and over with a wing loading times power loading ratio of 230 and over.

For scheduled operations of small transport planes, 3,000 feet at sea level is the minimum length recommended by the Civil Aeronautics Administration at present, and for other scheduled operations 3,500 feet at sea level should be the minimum, according to this agency.

The length of landing strips must be lengthened for higher altitudes at the rate

of approximately 250 feet for each 1,000 feet above sea level. This is because the atmosphere becomes more rarefied and transport planes need to make a long run in taking-off. A chart has been prepared by the Civil Aeronautics Administration showing the effect of elevation on landing area utility.

Airports Rise In Number

The United States by the end of 1944, the Civil Aeronautics Administration reports, will have approximately 600 class IV or better airports, approximately 416 class III airports, approximately 900 class II airports (for planes of the small size transport or larger size private owner type), and approximately 1,213 class I airports (for small private owner type planes up to a gross weight of 4,000 pounds). Altogether these airports total 3,129. They include many built by the Army and Navy which will revert to civil use after the war.

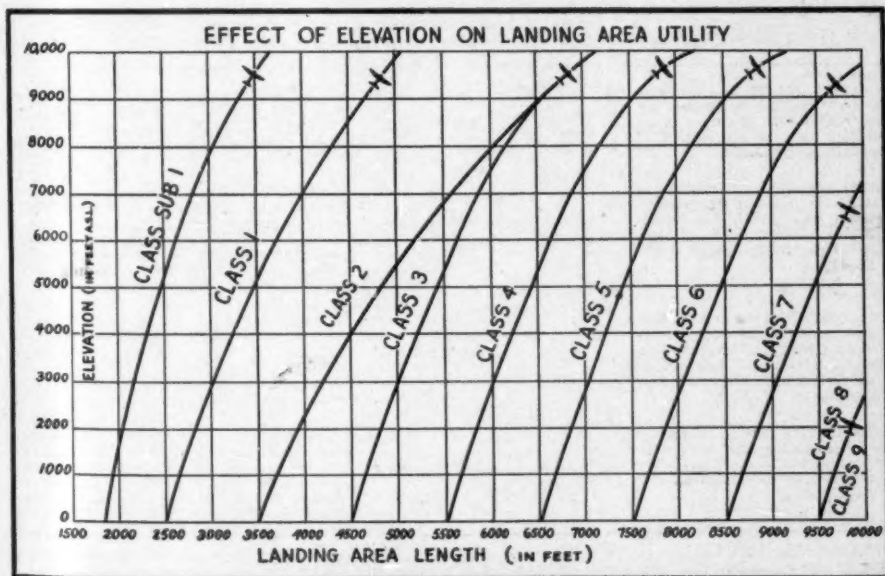
According to Administrator Stanton, these airports are good—as to size—for many years to come, although additional construction work is needed to make the airports efficient and attractive to the pub-

lic. For the overwhelming majority of United States cities, Mr. Stanton believes, runways of about 5,000 feet will be adequate for some time to some.

"It must be remembered," he says, "that when you put four motors on a plane instead of two, you increase the safety factor and thereby decrease the amount of runway needed. . . . We believe aircraft designers can turn out planes that will offer greatly improved performance without so increasing their wing-loading as to require enormous increase in runway lengths.

"Increasing the size of the airport probably doesn't increase the number of schedules than can be handled. The bottleneck is the number that can come in and go out under instrument flying conditions. With parallel runways, that is now only about six in and six out in an hour. This is because, under instrument flying, two airplanes cannot be brought down simultaneously unless they can be kept a mile apart laterally. With equipment and procedures we have some prospect of raising that up to 30 in and 30 out within a few years."

These views of administrator Stanton are most interesting to students of commercial aviation in Latin America. From



Elevation is a major factor in engine efficiency. The chart shows how runways lengthen with altitude.

these views it would appear that airport facilities in the other Americas, in view of the expansion now under way or planned, will be able to handle the post-war air transport planes without any great difficulty. Thus, with the problems of post-war airport facilities in Latin America presenting no insuperable difficulties, there remains only the problem of trained personnel—for obviously there will be no lack of planes and equipment on the market when war ends.

This problem of manpower—that is, the need in Latin America for skilled pilots, skilled radio men, skilled mechanics, skilled airport, administrators, etc.—is being tackled in accordance with the pattern of inter-American economic and technical cooperation adopted at the Third Meeting of American Foreign Ministers at Rio de Janeiro in January, 1942.

Civil aeronautical training in the United States has already been given to 609 young men from the other Americas—484 in

1942 and 125 in 1943 — by the United States Department of State and the Civil Aeronautics Administration. A third program has been authorized for young men of 14 of the other American republics. The training is from one to two years, and already 351 candidates have been graduated under the first two programs.

The office of Inter-American Affairs has cooperated in these training programs. It also has sponsored the Inter-American Escadrille, which is an international organization of civil flying clubs having for its purpose the development of Good Neighbor relations by civilians flying between the American republics. To meet the need for meteorologists, the Office of the Coordinator and the United States Weather Bureau jointly sponsored a meteorological school at Medellin, Colombia, where approximately 200 young men of the other American republics received meteorological training.

Consequently, it does not appear that

RECOMMENDED AIRPORT DESIGN STANDARDS FOR COMMUNITIES, CITIES AND METROPOLITAN AREAS

Type of Community	Planning Classification	Recommended Landing Strip Lengths—Sea Level Conditions—Clear Approaches*	Type of Aircraft Which Airport May Safely Accommodate
Small communities not on present or proposed scheduled air carrier system. Includes communities up to a population of approximately 5,000.	1	1,800' to 2,500'	Small private owner type planes. This includes roughly planes up to a gross weight of 4,000 pounds, or having a wing loading (lbs./sq. ft.) times power loading (lbs./HP) not exceeding 190.
Larger communities located on present or proposed feeder line airways and which have considerable aeronautical activity. General population range 5,000 to 25,000.	2	2,500' to 3,500'	Larger size private owner type planes and some small size transport planes. This represents roughly planes in the gross weight classification between 4,000 and 15,000 pounds, or having a wing loading (lbs./sq. ft.) times power loading (lbs./HP) of 190 to 230.
Important cities on feeder line airway systems and many intermediate points on the main line airways. General population range 25,000 to several hundred thousand.	3	3,500' to 4,500'	Present day transport planes. Planes in this classification are represented approximately by those between 10,000 and 50,000 pounds gross weight, or by those having a wing loading (lbs./sq. ft.) times power loading (lbs./HP) of 230 and over.
Cities in this group represent the major industrial centers of the nation and important junction points or terminals on the airways system.	4	4,500' and over	Largest planes in use and those planned for the immediate future. This approximately represents planes having a gross weight of 50,000 pounds and over or having a wing loading (lbs./sq. ft.) times power loading (lbs./HP) of 230 and over.

*Approaches shall be clear within a glide path of 20 to 1 from the ends of the runways in the case of Class 1 airports and 30 to 1 in the case of Class 2, 3, and 4 airports except for instrument landing runways for which the ratio shall be 40 to 1 from a point 4,500 feet from the beginning of the runway.

NOTE:—For scheduled operations of small transport planes 3,000' is the minimum length recommended at present. For other scheduled operations 3,500' should be the minimum considered.

problems of airport facilities, of planes and equipment or of trained personnel are likely to block to any considerable extent the increase of air-borne interchange of people and goods between the Americas after the war. There is no question of the need — and the desire — for this interchange. Our southern neighbors need us, and we need them. They want to visit us, and we want to visit them.

Neither is there any question but what commercial airlines are eager to supply air transportation. As of April 15, 1944, there were, for example, 45 applications pending before the Civil Aeronautics Board for new air services to the Caribbean and Middle and South America.

Air transport, I feel sure, will overcome those natural barriers that in the past

have prevented easy access between the United States and the other Americas and, equally important, between and within the other American republics. Our hemisphere's air systems will enable the visitor from Buenos Aires to travel on business or pleasure throughout the United States with utmost ease and facility and speed. Similarly, the traveler from New York will be able to reach Buenos Aires in approximately 24 hours thanks to night-flying in four-engined planes.

In the post-war era when the aspirations of the other Americas for modern air transport can be physically realized, Western Hemisphere airports will continue the development of aviation which has already made the other American peoples the most air-minded of any in the world.

Air Routes Sought By Moore-McCormack

A post-war overseas airline service to provide five routes, four of which would serve Buenos Aires from New York is being sought by the Moore-McCormack Steamship Company in an application now before the Civil Aeronautics Board. The fifth route would serve points in the West Indies. The company is seeking participation in the transportation of persons, property and mail. The proposed routes follow:

New York to Buenos Aires, with stops at the following intermediate points: San Juan, P. R.; Port of Spain, Trinidad; Belem (Para), Br.; Sao Salvadore (Bahia), Br.; Rio de Janeiro, Br.; Sao Paulo, Br.; Porto Alegre, Br., and Montevideo, Uruguay.

New York to Buenos Aires, with stops at the following intermediate points: Hamilton, Bermuda; San Juan, P. R.; Port of Spain, Trin.; Belem (Para), Br.; Sao Salvadore (Bahia), Br.; Rio de Janeiro, Br.; Sao Paulo, Br.; Porto Alegre, Br.; and Montevideo, Uru.

New York to Buenos Aires, with stops at the following intermediate points: Hamilton, Bermuda; St. Thomas, V. I.; Port of Spain, Trin.; Belem (Para), Br.; Sao Salvadore (Bahia), Br.; Rio de Janeiro, Br.; Sao Paulo, Br.; Porto Alegre, Br.; and Montevideo, Uru.

New York to Buenos Aires, with stops at the following intermediate points: Nassau, B. W. I.; Ciudad Trujillo, D. R.; Port of Spain, Trin.; Belem (Para), Br.; Sao Salvadore (Bahia), Br.; Rio de Janeiro, Br.; Sao Paulo, Br.; Porto Alegre, Br., and Montevideo, Uru.

New York to New York, with stops at the following intermediate points: Nassau,

B. W. I.; Ciudad Trujillo, D. R.; San Juan, P. R.; St. Thomas, V. I., and Hamilton, Bermuda.



Admiral Rosendahl Pleads For Commercial Airship Development

REAR Admiral Charles E. Rosendahl, commander of Naval lighter-than-air forces and one of the nation's foremost advocates of the airship as a medium of transoceanic commerce and travel, has predicted an active post-war role for dirigibles.

In recent speeches and articles in which he took the stump for the airship he revealed that airships larger than any so far operated will fill a post-war need for transportation at speeds and cost somewhere between surface shipping and airplanes. Admiral Rosendahl makes a persuasive case for the economy and utility of the airship as a commercial carrier. At the recent Conference on Inter-American Development held in New York City, he told his audience:

"The airship can fly at a speed which is much in excess of surface speeds, but still is far more economical than the speed of an airplane."

Admiral Rosendahl believes it would be fitting to add to the communications systems in the airplane world between the United States and Central and South America, an airship service, and adds that it would be feasible, economical, safe and reliable to operate airships down both coasts of the hemisphere to the south.

In a review of the record of commercial operation of lighter-than-air craft which he said had regrettably been developed chiefly by the Germans, he pointed out that airships had demonstrated themselves as more reliable than flying boats. Until the Hindenburg disaster in May, 1937, not one passenger had been injured in flights taken in a dirigible. He added that the Hindenburg disaster might have been averted were the airship filled with helium instead of highly inflammable hydrogen. The United States, by virtue of its unlimited supply, as well as its monopoly on helium, he contends, could outstrip the world in further development of such craft.

Admiral Rosendahl has come up with some interesting comparative figures on the relative speed of the airship and airplane in long-distance flights. In flying the Pacific, he maintains, planes average only about 35 miles per hour from their scheduled time of departure to their time of arrival because of refueling, night stop-overs and other deterrent factors. Using the trip from San Francisco to Hong Kong as an example, Admiral Rosendahl declared that the Hindenburg, traveling non-stop could have made the trip at an average speed of something less than 75 miles per hour in 4 days 15 hours, while planes consumed as much as 8 days 8 hours.

The Admiral does not belittle the airplane, which is constantly improving in speed, range,

load and which will show even more development. But he adds, 10,000,000 cubic feet airships filled with helium, can carry ten times the load of any existing plane at about half the speed of the airplane to the limit of its non-stop range.

There is little question that as a result of the Admiral's discussion, the airship emerges as a vehicle which deserves careful consideration in any post-war program of air transportation and air commerce.

Activity in support of Admiral Rosendahl's contentions is already in evidence. The files of the Civil Aeronautics Board in Washington today contain an application for 41,633 miles of foreign routes using dirigibles of 10,000,000 cubic feet helium capacity.

The application filed by United Nations Airships Inc. asks for the following route:

Washington to Buenos Aires, Argentina, via Rio de Janeiro; Washington to Calcutta, India, via Dakar, Capetown and Zanzibar; Washington to Moscow via Glasgow; Washington to Brisbane, Australia, via Los Angeles, Honolulu, Chungking and Darwin.

It still isn't too late to pick up the program of development, Admiral Rosendahl declares, even in view of all the magnificent planes in the air today and those bound to come.

"From my study of the whole picture," he adds, "I can't help but believe that when we recognize the full facts of the case the big ocean-going airships are definitely going to be back in the picture. The airplane cannot fly slowly enough to be economical."

Engineering Sessions Added

Sessions on air transport engineering have been added to the program of the National Aircraft Engineering and Production Meeting scheduled for October 5-7 at Los Angeles, Calif., according to a recent announcement by the Society of Automotive Engineers, sponsors of the meeting. Three sessions on this phase of engineering will be held under the auspices of the newly organized SAE Air Transport Engineering Activity. Under consideration will be the safety, economy, reliability and convenience of air transport and of aircraft.

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AND IN THE
DAYS
TO COME**



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"Packaged" Airports Travel Anywhere; Fill Equipment Needs

Westinghouse International's New Units Provide Everything From Generators To Buildings

By J. L. DECUBAS

Westinghouse Electric International Co.

AIR TRANSPORTATION is assured of enormous postwar expansion, but it can only grow as rapidly as its physical facilities. The war has given impetus to the training of personnel, the development of airplane design and the spread of an international network of airports. Yet it will take enterprise and ingenuity to convert these gains to commercial and public use.

One of the basic air transportation needs is the development of an adequate, efficient airport network on an international scale. This need is not to be met by the mere addition of a number of large terminals and simple emergency landing strips along the way. Necessary as the trunk lines are, the full exploitation of air transportation possibilities depends on the laying down of a system of secondary or feeder airports to connect outlying territory more directly with the main lines of communication.

Engineers of Westinghouse Electric International Company have gone to the heart of this special problem, studying from every angle the equipment needs of secondary airports. The result is "packaged airport equipment," planned for shipment and erection anywhere in the world. Field layout and grading, which are best treated individually, and actual installation, are left to the purchaser. Aside from these, a multitude of items from technical instruments to prefabricated buildings has been carefully selected.

A special advantage of the plan is the consolidation of purchase and shipment. All items, whether of Westinghouse manu-

facture or not, are consolidated by Westinghouse International at a single point of shipment; the purchaser need deal only with a single responsible source of supply.

The packaged airport equipment has been ingeniously planned on two general principles: standardization and flexibility of choice. For ease of selection and handling at every stage, the Westinghouse engineers have gathered the material and equipment into a series of 208 assemblies, then consolidated and listed these on 41 "assembly sheets" containing general descriptions, general bills of materials, plans and perspective drawings. These assemblies have been further classified into ten functional groups: electrical generating and distribution equipment; communication and radio navigation devices; airport lighting equipment; meteorological equipment; gasoline storage and fueling equipment; water storage, purification and distribution equipment; miscellaneous field units; sewage disposal systems; fire-fighting equipment; and buildings. By means of these assembly sheets the problem of equipping a complete airport has been enormously simplified.

Every airport regardless of functions or location requires a certain minimum of equipment, including a source of electrical supply, radio communication and navigation aids, lighting equipment, gasoline storage and pumping units, administration building, and (with few exceptions) hangar facilities.

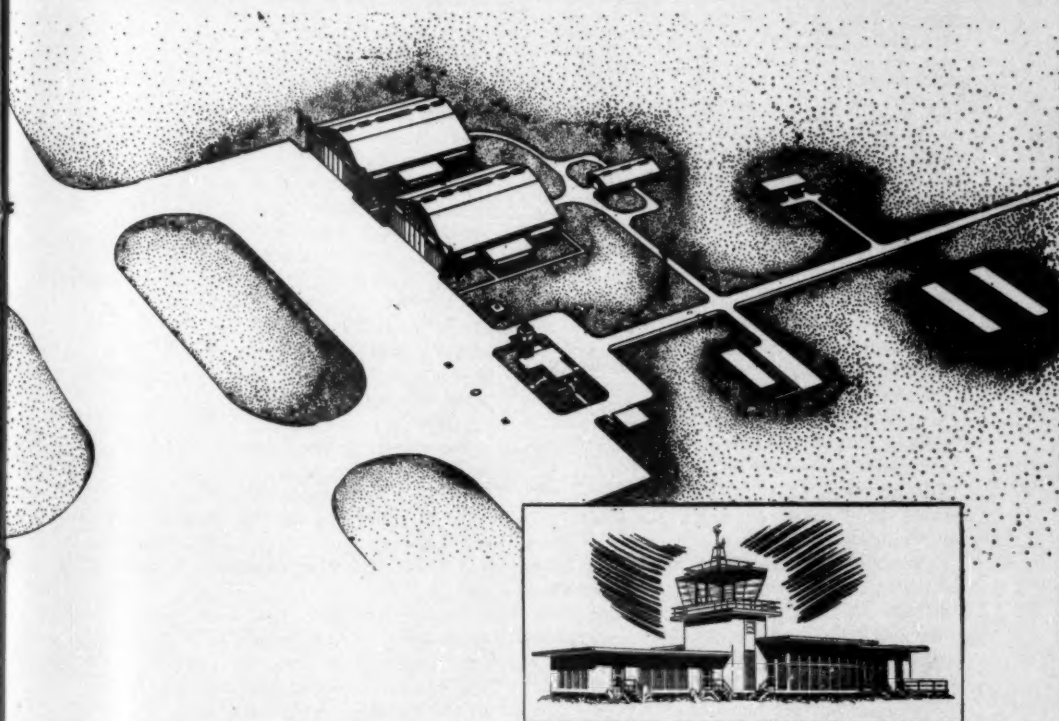
But equally as important as airport similarities are their differences: in size and cost, in climatic conditions, in services to be rendered, in availability of electrical power and of meteorological information, etc. These diverse factors have been considered in great detail in planning the packaged equipment.

Because of the freedom of choice and easy interchangeability of assemblies, it is possible to arrange the desired combination of equipment for almost any secondary

airport. A complete airport may require items from each of the types of equipment listed in Table I.

The assembly sheets contain sufficient information to make clear the adequacy of each assembly for its specific function under given conditions. For example, the electric generation and distribution system specified are described and illustrated in detail. Diesel engine-generator units are available in four capacities 50, 75, 100 and 150 KW, with, in each case, an extra 50 or 75 KW unit as standby to insure uninterrupted operation.

The recommended distribution systems are of two general types: those for airports with a total average load up to 75 KW, and those for airports with a total average load over 75 KW. The equipment has been chosen only after a study of elec-



SHIP AN AIRPORT—An architect's drawing of a possible arrangement of a large packaged airport. The runways, however, are included only for pictorial effect. Twenty variations of terminal buildings alone are available in packaged airport equipment. Inset represents Type D, the largest of four basic types, with a flat roof designed for tropical zones. The packaged airport has just been developed by Westinghouse Electric International Co. Combinations for the erection of any type airport can be supplied and even shipped by air if desired.

The Writer

A native of Tangiers, Morocco, Mr. deCubas might well be called continental by virtue of having lived in Scotland, Tunis, Portugal, France, Spain, Holland, and Belgium. He fled the latter country soon after it was occupied by the Germans and came to the United States in 1940. He was educated in Paris and was engineer of the Ecole Superieure d'Electricite and the Ecole Speciale de Mecanique et Electricite.

Mr. deCubas has also held posts as production engineer in the Neonray Lamp Factory in Madrid; and as sales engineer and acting manager of the Frigidaire division of the General Motors plant in Antwerp. He has lectured on lighting in Central and South America, and at the present time is special representative of the Westinghouse Electric International Company, lighting apparatus division. Mr. deCubas also helped co-ordinate the development of the Westinghouse packaged airport equipment project.



trical load problems of existing secondary airports, which has shown that their average electrical load varies between 50 and 150 KW.

Thus full generating equipment is provided for all sizes of secondary airports, making possible their location in regions without a source of electrical power. But where such source is available, the generation assemblies can be omitted and the assemblies for a simple substation will be sufficient.

Each of the other functional groups has been classified and illustrated. Thus a wide selection of communication and radio navigation devices has been arranged, including various types of telephone and public address system equipment and intermediary, high and very high frequency transmitters and receivers, including Cone of Silence marker and Fan marker transmitters. Airport lighting assemblies, further classified functionally into six groups, are provided for fields having from one to four runways.

Because of variations in functional and climatic requirements, the 73 basic building assemblies have been planned to allow considerable freedom of selection. Four sizes of prefabricated hangars are offered, from a simple nose hangar for temperate and tropical use to Hangar C, for storage and repair of planes with wing spreads up

to 160' and lengths up to 200', which may house a machine shop suitable for all but major repairs.

All buildings except the nose hangar can be supplied in variations designed for temperate, tropical and arctic climates. Terminal buildings are listed in four basic sizes, each of which has variations allowing for three climates, and for flat or sloping roofs.

Type A may be adequate for very small feeder airport functions, private flying, resorts, meteorological and mining developments.

For airports handling a similar limited traffic, but requiring more self-sufficiency, Type B is suitable. It differs from the smaller buildings by the addition of living quarters, made up of a living room, two bedrooms, kitchen and sanitary facilities.

Type C building, consisting of an operations room and a large passenger lobby with related services, is a rugged steel frame structure capable of handling an uninterrupted flow of traffic.

Building D, the most impressive of the terminal assemblies, is designed for intermediary international airports, large market centers, etc. Essentially it is a development from the next smaller building, with the enlargement of the passenger lobby, and the addition of a control tower

Table I—Items to be Included in Westinghouse Packaged Airport Equipment

General descriptions, specifications, bills of materials, plans and installation drawings are provided for each assembly

Electrical generating equipment (4 capacities)
Electrical substations (4 capacities)
Distribution pole assemblies (High and low voltage)
Transformer bank assemblies (5 to 150 Kva.)
Runway contact lighting systems (1 to 4 runways of 2,000 to 12,000 ft. lengths)
Boundray lighting assemblies
Beacon tower assemblies (51 to 108 ft. high)
Field floodlight assemblies (1 to 4 runways)
Lighting control and signal assemblies
Miscellaneous airport lighting equipment
Radio transmitter and receivers
Telephone equipment
Public address systems
Meteorological equipment
Mobile field units (portable floodlights, crash trucks, fueling units, station wagon, snow plow)
Gasoline fueling systems (20 to 200 gal. per min. pumping capacities)
Water pumping, distribution and purification systems. (For 16 to 200 people)
Fire fighting equipment
Sewage disposal systems
Pre-fabricated hangars (four types)
Machine tool equipment
Terminal buildings (four basic types, five variations of each)
Pre-fabricated power houses (10 variations)
Pump houses (5 variations)
Transmitter buildings (5 variations)
Pre-fabricated warehouse buildings (7 variations)
Pre-fabricated barracks buildings (5 variations)
Pre-fabricated guest house buildings (5 variations)
Pre-fabricated garage buildings (5 variations)

and a wing for international traffic.

A recent Westinghouse publication on packaged airport equipment demonstrates the practicality of the assembly sheets by specifying four typical secondary airports, graduated in size and complexity, made up of listed assemblies. It is probable that with only slight changes in the given selection of assemblies, these model airports can meet almost any airport problem. Yet these are only four possibilities out of an almost unlimited number of variations.

The advantages of packaged airport equipment are obvious. Westinghouse International has simply been able to apply to a new field the engineering and marketing principles of efficiency, uniformity and simplicity.

The result is the practical elimination of all engineering, with the exception of the civil engineering inherent to ground conditions, and construction and installation work on the site. Furthermore, purchasing, shipment, installation, operation and maintenance are greatly facilitated for the customer, all of which means significant decreases in cost.

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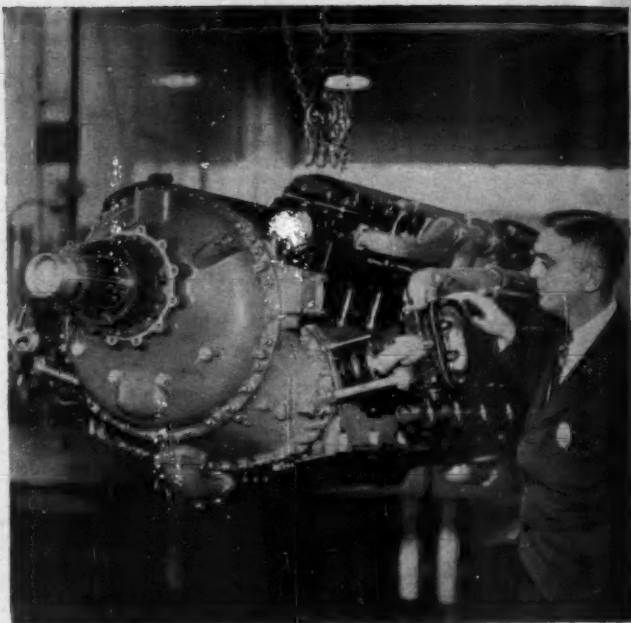
- 1 Current lists of available surplus materials located throughout the United States and changes thereto, sent to us by contractors are consolidated into our Master Inventory Record, at no cost to the contractors
- 2 As production requirements arise, contractors' purchasing departments submit them to us for a "locating check" against the Master Inventory Record. We locate the required materials and coordinate shipment between buyer and seller. All quotation requests are promptly handled, with critical telephone or wire requests receiving special attention.
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R. M. Hazen, chief engineer of the Allison Division of General Motors Corporation, looks over the new Allison 24-cylinder, liquid-cooled aircraft engine, possessing horsepower greatly in excess of the most powerful airplane power plant now in service. Tested and proven, the new engine is ready to go into service against the enemies of the United Nations. The new engine has maximum ratings approximating 3,000 horsepower.



World's Most Powerful Engine Made By Allison for Fighter Planes

The world's most powerful aircraft engine, which will increase the engine power of the majority of single-engine aerial fighters by several hundreds of horsepower, is now at the service of the United States Army Air Forces, according to E. B. Newill, general manager of the Allison division of General Motors. The new engine has maximum ratings approximating 3,000 horsepower.

Designated as the V-3420 series, the new Allison is a 24-cylinder, liquid-cooled engine. It has exactly twice the piston displacement of the present standard Allison 12-cylinder engine, which powers the Lockheed Lightning, the Mustang P-51, the Invader A-36, the Airacobra and the Warhawk.

Simplified designing in the power section of the new motor—97 per cent of the piece parts are interchangeable with those of the present Allison—has assured early mass production of the new engine at the home of the Allison division in Indianapolis, Ind. It was explained that this means that the new engine is already in effect in production with spares and replacements available in air force depots of the United Nations all over the world. This also means, it was said, that no additional training will be required for men now stationed in all of the principal theaters of war whose task it is to service Allison powered fighters.

Although the present standard Allison 1710 engine has an over-all design aspect of a "V," the new motor has that of a "W," formed by four banks of six cylinders each. The design is so compact that there is remarkably little increase in frontal area compared with the horsepower increase, a distinctive feature of the Allison.

Designing the new power plant, it was said, has also resulted in a definite decrease in the weight per horsepower. Many uses for the new Allison are envisioned, since it not only can be installed in a conventional pursuit plane nacelle, but it has been specifically designed for "buried" installation, which means that in multiples it can be used to power the largest multi-engined planes in the world. The "buried" engine installation presages the ultimate elimination of power plant drag in airplanes.

Development of this engine began at Allison in 1937, work having been started on it shortly after the first 12-cylinder Allison passed its Wright Field Army tests in June, 1943. During 1939-40 development was shelved because of demand for further development and production of the 12-cylinder types to meet specific fighter plane needs of the United Nations. Concentrated work on the 24-cylinder engine was resumed in 1941 and completed early in 1942.

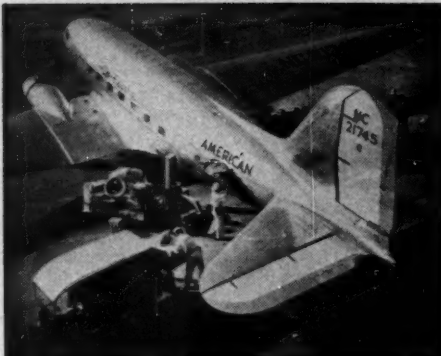
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THE NATIONAL AND INTERNATIONAL **AMERICAN AIRLINES Inc.** ROUTE OF THE FLAGSHIPS

JUNE 1944—PAGE 25

Transportation Costs Provide Key To Goods In Air-Borne Traffic

Lightest Possible Packing Is Expected To Affect Air Freight Rate Structure

By A. W. FRENCH

*Mail and Express Traffic Manager,
Transcontinental & Western Air, Inc.*

THE magic carpet effect of air travel has undoubtedly broadened the horizons of many American manufacturers as to the post-war potentialities of export trade. A realistic approach as to what commodities will find their way over international trade routes and how they will be carried can be made only by analyzing the factors of transportation costs.

In international trade there is a great difference between what a producer or exporter receives for his goods and what the consumer in a foreign country pays. Intermediate charges enter heavily into final cost, and articles selling for \$50 in the United States may well have to be sold for \$100 in some foreign countries.

The costs that so boost the price of our goods delivered in foreign countries result from charges for export packing, inland transportation, transshipments, consular fees, marine insurance premiums, import duties and financing costs. Air transportation today stands ready to assume as important part in reducing these transit costs.

Despite the fact that the size of air cargo planes undoubtedly will increase in the future, the proportion of carrying capacity to surface units undoubtedly will remain on the small side. Therefore, value in relation to weight is likely to remain the determining factor for some time to come. Speed in delivery also will be very important.

This acceleration in speed will develop

many transportation savings, outstanding of which is packaging and the resulting handling costs. Packing for "export" when surface transport is to be used, has always been extremely important, especially if the destination is an interior point reached by primitive transport from the seacoast.

Containers To Reduce Cost

Heavy protective packing is imperative in order to avoid damage claims, if, during its journey, a shipment should encounter several transshipment rehandlings or was destined to be trugged up some mountain trail in China, Bolivia, India or Russia, lashed to the back of a donkey or coolie. Export wooden boxes often weight up to 30 per cent of the weight of the product itself. If containers are developed to the ratio of 10 per cent of the weight of the product, we achieve a sizeable reduction in air shipping charges.

While the purpose of reducing the weight of the container is to reduce the transportation charge, several indirect benefits result, including (1) lower con-



A. W. French

tainer costs; (2) lower carting costs; (3) lower duties where such are assessed on weight; (4) lower damage claims because of few handlings; (5) lower insurance costs because of lower claims.

Export packing charges have always been high for ocean transportation. Methods of ship loading and stowage have demanded strong and heavy boxing and crating. Facilities for handling cargo in foreign ports, as well as in our own, are often inadequate, so that cargo stands the chance of being damaged, unless fully protected by special types of export packing. As a result, export packing sometimes increases the cost of the article itself by from 10 to 20 per cent. In most cases this is not the cost of the container itself, but rather the pyramided charges on it, since ocean freight is paid on a weight or measurement basis whichever yields the steamship operator a greater revenue.

Also, customs duties and internal revenue taxes in foreign countries are greater, because they are generally based upon the landed cost of the shipment, including the value of the container. Certain kinds of containers, notably metal tanks and cylinders, are dutiable separately in certain countries. In some countries, such as Costa Rica, Honduras, Columbia and Venezuela, duties or taxes are assessed upon gross weight.

It is very possible that these costs taken

together would prohibit the consumption of some American goods in certain markets where the goods would enjoy a heavy demand if they could be laid down there at a price level the community could afford and which would still return the American exporter a profit.

It is not to be inferred that by air, all rehandling and transshipping is to disappear, nor that the airlines will fly door-to-door in every case. However, in countries where surface barriers have prohibited roads and railroads, many communities were served by airlines, even before the war. As close to us as 8 air hours from Miami, Fla., such situations exist today in Central and South America. In Alaska and parts of Canada the same is true.

Factor of Weight

Weight is a primary factor in determining air cargo charges. This is because airplanes are licensed by the government to take off with a maximum overall weight of the airplane and all its contents whether gasoline, passengers or revenue cargo. Airplanes sometimes may be fully loaded with goods in terms of weight, because of concentration of weight in a few heavy items, yet there may still be a large amount of space unfilled. Because of this fundamental point, it is evident that any saving in container weight results in a direct saving in air transportation charges.

Aside from the less frequent rehandlings in air, why can less packing be used in air transport? The reason is inherent in the fact that an airplane itself is constructed of the lightest materials that safety permits. Air borne goods receive very gentle handling compared to goods moving on the ground if for no other reason than rough handling in and out of the plane might damage the airplane more than the goods shipped. Once loaded aboard, shipments must be secured more carefully than aboard a steamer because any shifting of weight in flight would unbalance the aircraft and create a hazard to safe operation.

During the war many methods of stowage on aircraft have been developed. Experiments of repacking have been conducted with the result that reductions in packing weight of airborne shipments as high as 15 per cent have proved entirely satisfactory. As experience builds up,

even greater savings are possible. Substitution of lighter packing materials may prove practical in the case of domestic or export air borne shipments of heavy weight now requiring heavy wooden boxes. For example, an open crate may suffice where a solid crate is used now; plywood might replace heavy lumber; or, burlap might replace wood, plywood or cartons.

In a survey conducted by one aircraft manufacturer, it was found that an aircraft engine exhaust manifold had a net weight of 34 pounds. Packed in a wooden box weighing 93 pounds, the shipment had a gross weight of 127 pounds. By wrapping in burlap, weighing 6 pounds, the gross weight was reduced to 40 pounds, or a net saving of 87 pounds.

Similarly, wing parts with a net weight of 18 pounds were packed in a wooden box weighing 57 pounds, or a gross of 75 pounds. By using burlap, 49 pounds in tare weight was saved.

In one month of 1942 one domestic air freight terminal handled 348,000 lbs. of air freight. Of the total weight, approximately 139,200 pounds, or 40 per cent, represented tare weight.

Packing and Rates

Converting these figures to a consideration of commercial airline costs of investment in equipment and operation, it is evident that the lightest possible packing to insure adequate transit protection will have material effect on post war air freight rate structures.

The airlines are now attempting to evaluate the tonnage of commodities susceptible to air commerce after the war. A domestic and international market analysis has been instituted by the airlines as a group to determine what products move, between what markets, in which direction, in what quantity, at what season, by what means of transportation, and at what rates. We must get a reasonable indication of what quantity will be shipped by commodity groups and between what market areas, both domestic and international.

This information is important to determine the rates necessary to develop sizeable tonnage; the type and size plane necessary; what schedules to operate; and the basic sales data which will influence

the potential shipper. To develop this data our survey seeks to determine not only the tonnage by commodity groups, but the characteristics in a given business which determine the means of transportation used.

No one actively connected with air transport seriously believes that air cargo transportation will supplant general surface shipping. There are millions of tons of raw materials, including minerals and products of the soil which must move at very low cost or not at all. These have always moved in large bulk and except in special cases, do not seem susceptible to air transportation as far ahead as we can now see.

Therefore, value in relation to weight is likely to remain the determining factor indefinitely, as to what products are most susceptible to air borne traffic in heavy and frequent volume.

No nation can merely sell and never buy internationally, otherwise her foreign customers would have no bank balances with which to pay for their imports. The ability of the airplane to annihilate inaccessibility of markets for the exporter, will, by the same ability to overcome limitations of terrain, offer our importers a means of bringing to us many foreign products which heretofore were not imported because of perishability, fragility or lack of demand in this country.

The present air equipment available, operating largely in military service, puts any place on the globe within 60 hours of any other point. A few examples indicate the comparative travel time and distance between surface and air carriers:

From	To	SURFACE		AIR	
		Miles	Time Days	Miles	Time Hours
New York.....	Chungking, China.....	11,300	31	7,500	38
New York.....	Moscow.....	5,700	8	4,525	23
New York.....	London.....	3,700	5	3,462	17
San Francisco.....	Brisbane.....	8,200	21	7,050	35
Chicago.....	Fairbanks, Alaska.....	4,090	8	2,730	14

These comparisons of time and distance should serve to stimulate the post-war thinking not only of American exporters who will resume their commercial trade when peace comes, but of the many American manufacturers who, until the war, were content to do a domestic business.

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Vice Pres. of Engineering
Transcontinental & Western Air, Inc.

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Tomorrow's Global Planes

Post War Mars Models Promise Unheard of Air Cargo Economy

IMAGINE, if you can, a giant flying bird with huge wings soaring great distances. The shadow it casts is huge, and the noise it makes as it streaks through the air is great. It is the Martin "Mars," giant of the airways, and largest operating airplane in the world.

This 70-ton mammoth of the sky is today filling a vital role for a nation at war by carrying essential goods and mail for the United States Navy. So well is it doing its job that orders have been placed by the Naval Air Transport Service for twenty more planes that will even dwarf their predecessor. Changes

in design for the production version of this plane are reported to have increased cargo capacity, and several external changes have also been made to increase its efficiency.

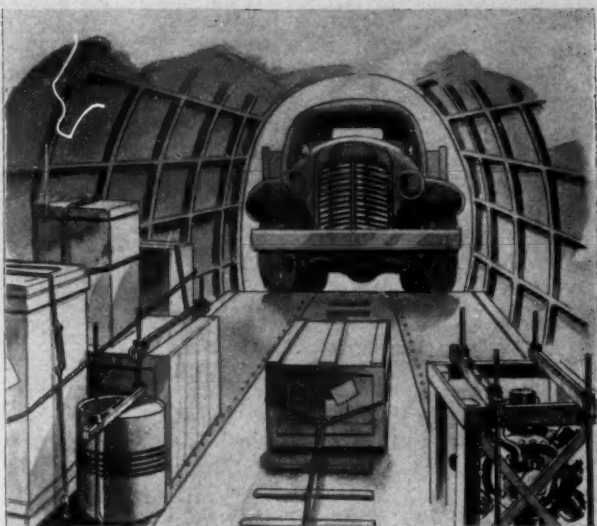
Designed primarily for carrying cargo, the redesigned plane designated as the JRM-1 will have fittings to permit its rapid conversion into a hospital ship, a passenger transport or a troop carrier. The current wartime version of the JRM-1, now in operation between California and the Hawaiian Islands, is stripped of all luxury appointments.

So huge is the production version of

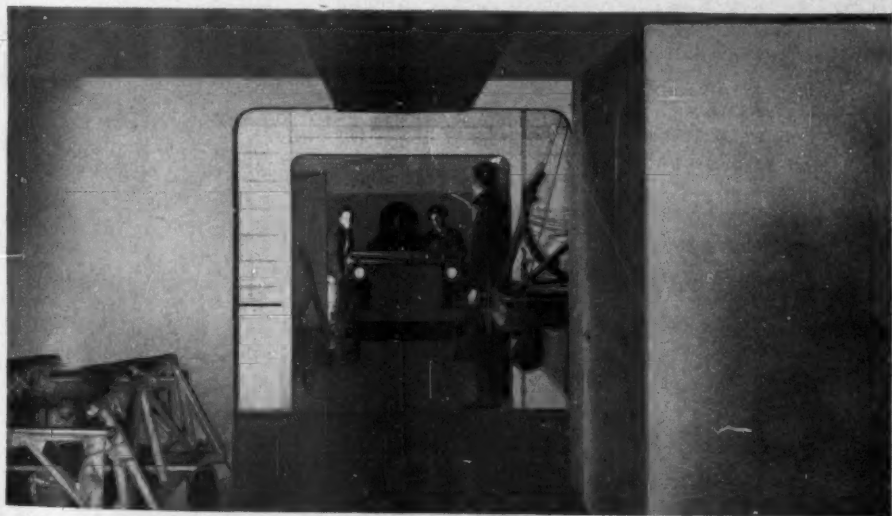
INTERIOR of the new plane is especially arranged for cargo handling, including power winches and skids. Vehicles can be driven into the body over a power-controlled ramp.

this plane that it is designed to fly with weights up to 145,000 pounds as compared with the design weight of 140,000 pounds for the original.

In the post-war period, the great Martin flying ships may be expected to be the model for over-ocean transport. The role it may play then is now being studied, and three possible versions of this plane have already been envisioned. One, of course, is for passenger service; a second, for trans-oceanic air cargo; and the third for combined cargo, passenger and air mail transport. Externally the versions are somewhat alike, but it is in the interiors of these planes that significant differences will be noted.



The Mars, for its designers and those interested in its progress, is more than an airplane, it is a dream come true. As a record breaker and record maker, it is visual and tangible evidence that planes of its size can and will be economical cargo and passenger carriers. Its 200-foot wing span, four powerful 2,200 horsepower Wright Cyclone engines and its non-stop range of more



CARGO SPACE—A feature of the full-scale mock-up of the JRM-1, the new Mars Transport, is its wide doors for cargo handling.

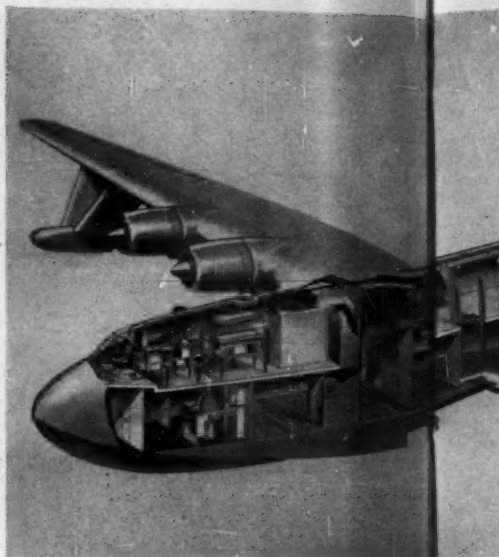
than 5,000 miles are now accepted as bases for design.

Demonstrating that cargo-carrying efficiency of a flying boat increases with its size, the Mars on Jan. 26 of this year drew into the Alameda, California, Naval Station with over \$130,000 payload in her hull. Air transportation officials were amazed by the fact that the total revenue of air mail, assuming it was all paid and eight passengers amounted to more than \$54 per mile. A similar per-mile revenue on a 2,400-mile flight with a standard passenger airliner would mean charges of more than \$6,000 for each passenger on the trip which necessarily would have to be made in easy stages with stops for refueling.

Post-war plans of the Glenn L. Martin Company call for the production of Models 170-21, 170-22 and 170-23. The first of these three models, all versions of the current Mars, is being planned as a commercial passenger flying boat with upper and lower decks fitted for the comfortable transportation of passengers. The second model will be an all-cargo plane with both decks stripped of encumbrances to permit the scientific storing of freight, while the last of the three new models is being planned as a combination passenger and cargo ship, with the upper deck furnished for passengers, and the lower deck designed for both passengers and cargo.

When the new three models are put in production America will be strong in its bid for air supremacy with these mammoth ships developed from the Mars.

Results of operations of the 70-ton flying boat by the Naval Air Transport Command in the Pacific, according to Glenn L. Martin, confirm his estimate that the plane can handle cargo at about an average of 10 cents per ton mile on an average 80 per cent loading. This compared with 40 cents per ton mile which domestic airlines figured for their cargoes. The 10-cent mile, he added, would be applicable to ships of 100,000 pounds or more. This inherent economy plus the record carry-

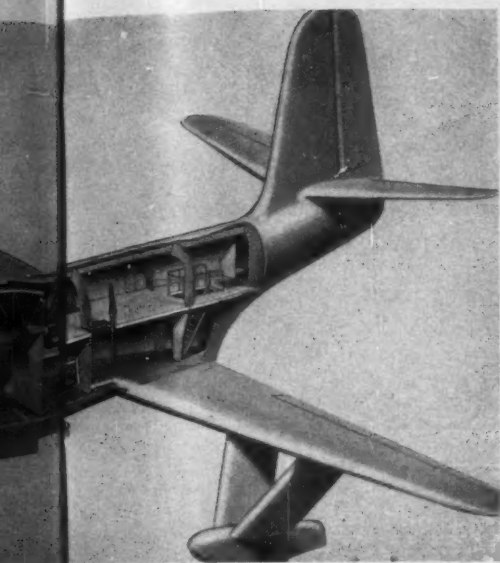


ing capacity of the Mars will be of special significance to post-war commercial aviation.

As interesting as its post-war story is, the story of the plane, which bankrupts the imagination, in Naval service today makes just as good a tale.

It was on a wintry day in January of this year that the Mars entered naval service with a flight from California to Hawaii with twenty passengers and a record cargo of 13,360 pounds of mail and highest war priority materials. High praise from ranking naval officers as well as members of her crew awaited the ship. Admiral Chester W. Nimitz recognized its importance as an instrument of war. "Mars helps to fill a demand which has existed for a long time," he said. "Every plane sent here will be working full tilt."

Chief Specialist William H. Perry, who has been with the Mars from the keel up, glowed with pride. The flight, he said, was another "orchid" for the queen of the air. They used to say, he recalled, that the Mars was over-bulky and would not fly. Another member of the crew said, "The Old Lady has made it again."



ALL CARGO VERSION — *The sketch above shows the interior arrangement of the Mars Transport type for the transportation of heavy cargo loads.*

Several days later on the return trip, the Mars set a new record in cargo carried by a plane across the Pacific. The ship completed the round trip in 27 hours, 26 minutes total flying time which is slightly faster than the clippers make it, and delivered 20,500 pounds of cargo and eight passengers. Here is what Lieut. Comdr. W. E. Coney, the 37-year-old skipper of the Mars, had to say: "She behaved beautifully. We carried twice the load ever flown by a plane to Hawaii when we arrived there Sunday morning, and then beat our own record on the way back."

"The Mars has proved herself economical too," he added at that time. "Per pound carried, it was the cheapest air haul ever made across the Pacific. This was a survey flight to see water

conditions, outside air conditions and to check problems of weight and balance. The gasoline consumption was most economical."

There is little or no doubt that this plane, designed originally as a battleship of the air but converted into a cargo transport, will have greater effect on the future of aviation, than perhaps any other single airplane.

With current trends in aviation as an indication, the planes of the future will grow bigger and faster and carry more and more of the world's costly freight. Refinements in packaging, coupled with technological advances, are almost certain to aid in the stabilization and reduction of rates necessary for greater audiences.

International air commerce is not yet a big business, but it is the Mars and the twenty planes patterned after it and now being constructed by the Glenn L. Martin Company for the Naval Air Transport Service, that will help it come into its own.

The entire industry today operates less than 220 planes. The industry has, however, come a long way since the days when it was principally dependent upon mail revenues. In 1931 mail revenues were 82 per cent of the total revenues, but in 1943, mail revenues represented only some 17 per cent of the total.

(Continued on Page 57)

NEW DESIGN—*Here is an artist's view of a new landplane especially designed for the carrying of cargo. It is not an adaptation of a current model. Loading is completed directly from trucks through a lifting tail section, thus simplifying handling.*





(Trade Mark)

Airport Planning Should Reflect Community Needs

Forward-looking communities which seek the fullest advantages of post-war air commerce were urged by C. Bedell Monroe, president of Pennsylvania-Central Airlines, to plan airports immediately on the basis of their community's actual needs and not to be influenced "by too many experts who are trying to expert a subject on which they are not expert."

"There is an almost universal misconception of what airport requirements really are," Mr. Monroe declared. "The lack of adequate airport facilities will erect an impenetrable barrier to the progress of commercial aviation. It is imperative that American cities plan for tomorrow on the basis of what is actually needed and that they aren't sold a bill of goods by these alleged experts."

Mr. Monroe asserted that there is too much quarreling between political and real estate factions; too much misinformation being bandied about; and too little planning of the type that will prepare the airports of this country for the accelerated post-war traffic.

CAA To Furnish Data To Airports

A special unit to provide data to airport managements on availability of airport equipment, uniform accounting systems, training and selection of personnel and airport managers and basic charges for all services is being set up by the Civil Aeronautics Administration, Charles I. Stanton, Civil Aeronautics Administrator, has disclosed.

Mr. Stanton said airports are a public responsibility in the same sense as highways and harbors, and added that municipal, state and federal agencies must join hands to make certain there will be sufficient landing fields of the right types in the right places.

In doing this job, Mr. Stanton pointed out, the natural division of labor is for the federal government to undertake the overall planning, since terminals must fit into a national pattern. The local details will be well managed by the states and municipalities. Financing, he believes, should be along the lines of the Federal aid highway system.

Traffic Control By C.A.A. To End In 23 Airports

C.A.A. operation of airport traffic-control towers in twenty-three cities throughout the country will cease on June 30 because of the refusal of the Army Air Forces to continue to supply the funds for the service. The Civil Aeronautics Administration, it was said, had originally undertaken the operation of the towers in 1941 at the request of the War Department because of heavy military traffic. The War Department, however, recently notified the C.A.A. that the towers are no longer considered essential to the war effort.

A total of 115 such towers have been operated by the C.A.A. in all parts of the country. A majority of the twenty-three whose operation is to be given up at the end of this month had been established at municipal airports and were supported by the cities to which they were attached. It is believed that these will now be returned to the cities for management and support. A few others, near small communities, will be abandoned.

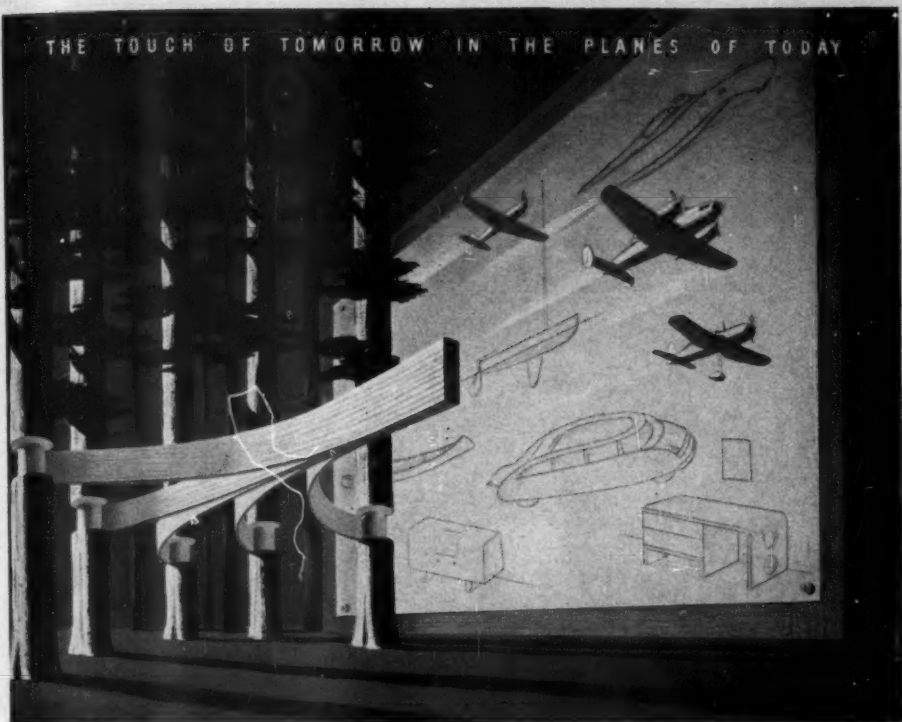
Boston To Be Key Air Center

Plans to take over 114 acres of land adjacent to the state-owned Logan International Airport to make this Boston skyport a key center for expanded post-war air routes have been announced by Governor Leverett Saltonstall of Massachusetts.

Development of the airport call for the construction of parallel runways measuring 10,000 feet. Work has already been started on the preliminary construction of three 7,000-foot runways and one of 5,000 feet. According to present plans the land which the state plans to acquire will be used as part of the general administrative zone, including airline office buildings, hangars, storage buildings, maintenance shops, freight terminal and other quarters.

Governor Saltonstall pointed out that the purchase of the land has already been approved by the Massachusetts Aeronautics Commission and tentative agreements have been reached on other parcels near the airport.

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Bendix Forms Helicopter Group For Passenger Model

The formation of Bendix Helicopter, Inc., a new corporation to produce a new type of helicopter carrying two passengers and baggage at a cruising speed of 100 miles an hour, as well as ten-passenger and twenty-passenger models based on the same principles, was just announced by Vincent Bendix, president of the new firm who resigned two years ago as chief executive of the Bendix Aviation Corporation.

The new company, Mr. Bendix said, is not in any way affiliated with the Bendix Aviation Corporation, but is a successor to Helicopters, Inc., which he founded in 1943 to develop a helicopter based on his own inventions. Three models are currently being engineered in the company's development program. Included is a two-passenger, 165 h.p. helicopter; a ten-passenger one-ton helicopter of 600 h.p.; and a twenty-passenger two-ton airbus of 1,200 h.p.

Members of the board of directors of the new corporation are Frederick K. Barbour, president, Linen Thread Company; Claire L. Barnes, founder, director and former president, Houdaille-Hershey Corporation; John A. Clements, public relations counsel; Hector J. Dowd, president, Certain-Teed Products Corporation; Laurence D. Ely, president, Reeves Sound Laboratories; James W. Garside, president, Langley Aviation Corporation; Charles L. MacDonald, partner of Tibbetts, Lewis, Lazo and Welch, attorneys; Lloyd Maxwell, first vice president, Roche, Williams and Cleary, Inc.; Robert J. Newhouse, Newhouse and Sayre, insurance underwriters; and Edmund W. Ross, president, C.P.A. Company.

Mr. Bendix will be president; Mr. Barnes and Martin Jensen, vice presidents; Mr. Garside, treasurer; and Mr. MacDonald, secretary of the new company.

Total transport aircraft of all types in domestic service on commercial airlines as compiled by the Public Information section of the Civil Aeronautics Board:

	As of May 18, 1942	As of May 18 1944
American Airlines, Inc.	74	52
United Air Lines, Inc.	52	42
Transcontinental & Western Air, Inc.	40	34
Eastern Air Lines, Inc.	39	24
Pennsylvania-Central Airlines Corp.	18	10
Braniff Airways, Inc.	15	8
Northwest Airlines, Inc.	14	10
Delta Air Corporation	9	6
Western Air Lines, Inc.	12	5
Chicago & Southern Air Lines, Inc.	6	5
Colonial Airlines, Inc.	4	2
Northeast Airlines, Inc.	6	2
Continental Air Lines, Inc.	6	4
National Airlines, Inc.	5	4
Mid-Continent Airlines, Inc.	9	4
Inland Air Lines, Inc.*	5	2
Total	314	214

(*) Western Air Lines' purchase of Inland Air Lines has just been approved by the Civil Aeronautics Board.

TWA Starts N.Y.-Chi. All-Cargo Flight

Transcontinental & Western Air, Inc., has just inaugurated a new all-cargo flight between New York and Chicago as a result of the receipt of additional equipment, according to an announcement by V. P. Conroy, vice president in charge of traffic. The new service is a round-trip between the two cities daily, except Sunday, and is in addition to the daily transcontinental round-trip cargo flight now being flown by TWA.

All cargo flights are being operated with so-called "stripped equipment," Mr. Conroy said. The planes to be used on the new flight are DC-3 airliners designed for cargo use.

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Speed, Economy, Convenience and Comfort are New Vital Values Related to Travel and Commerce

BY W. A. ANDERSON
Aviation Authority

AN eminent publisher told me of a recent conversation he had while flying with a transport pilot high above the South Atlantic. "You get familiar with the stars," said the pilot. "The whole world looks different from up here."

The publisher was deeply moved by this remark and all its implications.

But to my mind many of the implications are dangerously misleading. The generation of war-trained pilots will face serious disillusionment when it tries to apply war experience to commercial practice. When instead of looking at the stars, these young pilots realize that not only must they study operation and maintenance costs but they must find a means of defraying these and all costs, including research and experiment, out of passenger and cargo earnings, their thoughts must inevitably turn to earth again. They will have to look to the skies from an office window, not look at the earth from blue heaven.

War experience is not a good school for commercial aviation. War certainly makes possible tremendous progress and expansion, both in technical and personnel equipment and range of operation; but this advance is made at a cost in lives, wholesale destruction of equipment, reckless experimentation and plant investment for which no accounting need be made that is far beyond the wildest dreams of normal economy. No nation can continue to maintain this sort of progress and expansion in time of peace. The cost in lives alone, not counting those lost in combat

would be too appalling. The cost in subsidy would be beyond all resources.

I have no intention here to discuss the debatable possibilities of government subsidies and monopolies intended to compensate for excessive burdens on private investment, except to remind you that, in the commercial sense, the airship is just another conveyance. While its special characteristics may open vast new fields there is no valid commercial reason why it should be favored above railroad, automobile or ship. They are all cargo carriers, all passenger carriers. The differences between them are chiefly in their relative speed, capacity, economy, convenience, comfort.

Putting aside the need for air fleets for national security, since such air fleets in their relation to commercial planes are the same as a navy in relation to the merchant marine, what has the airplane to offer that will attract profitable business?

It has a great deal to offer, and it may prove the means for an enormous expansion and distribution of both domestic and overseas commerce. You all know of its technical limitations and you have a fair idea of its potentialities as carriers. But one thing of most critical importance that should always be in the thinking of manufacturers and operators is too frequently

ignored. This is the customer. Without sufficient customers for your vehicle and service you will soon be out of business.

For many years the railroads suffered seriously from keeping their eyes too close to the rails. They thought they knew how to run trains without outside opinion. Not until the coming of the trucks as popular competition did they show much interest in the customer. Not until the modern streamlined train was almost forced upon them by popular demonstrations that followed extensive advertising campaigns and public exhibitions did they come to recognize the significance of customer demand.

The original thinking of the railroaders was based on the assumption that if people wanted to travel overland they had to use the train. The only competition was from other railroads; and they fought not to please customers but to create monopolies. The coming of the automobile and the construction of highways broadened the competition. The coming of the airplane extends it further. But the introduction of each new form of conveyance widened the choice of the customer. Speed, capacity, economy, convenience, comfort took on new values relating to the need for travel or the advantage for shipment.

What has the airplane to offer that will attract customers?

As to cargo, this can best be determined on the basis of experience. Shippers will certainly use airplanes when it can be demonstrated to them that there is an advantage over competitors in terms of speed and economy—figured in terms of factory-to-store, not in terms of take-off to landing-field. This rule will apply whether the markets are within short-haul or at remote places overseas. But since aviation men are making a point of the accessibility of foreign markets, it is largely incumbent on them to sell the virtues of those markets to American manufacturers and merchants, and not merely to sell a mode of reaching them. A manufacturer may be very much interested in learning of air transport measurements, rates and service, but still he will not ship unless he knows what the market for his wares is beyond the landing-field and how he can sell profitably to customers in that market.

When the New England skippers wanted passengers for California, they sold California and packed the emigrants in. When the Milwaukee Railway wanted more passengers we recommended among other

things the opening of a Northern gateway to Yellowstone Park. During the week of the opening 76,000 visitors came to Gallatin Gateway. Most of them came by automobile, but the Railway got its full share and the Railway's Gallatin Inn was packed. Airline operators should think along these lines.

People who are likely to fly are already pretty well informed on what to expect of the plane. They will want to be informed on what they may see and do at the end of the flight—whether it is for sight-seeing or business. Tourists are going to be disappointed and express their disappointment if their itinerary is to consist of a series of Cleveland and Newark airports with neither time nor opportunity to witness and participate in the fascinations of new scenes and ways of life. Businessmen are going to be frustrated if their time and opportunities are wasted trying to orient themselves commercially in hurried look-arounds in strange markets.

The aviation industry has here a constructive job to do. There are inexhaustible resources of information and means of cooperation already available in order to enthruse, inform and guide the traveller. Certainly it should be in the province of the passenger and freight manager to organize these resources as an essential part of his plan to increase business. They should be equally essential to the advertising program.

For sometime we have been insisting that the world has suddenly shrunk—and the peoples and nations of the world have become neighbors. Aviation has made us neighbors. Aviation should now present us one to another so that we may visit and trade together as understanding friends.

Maintains Gross Loads

The Civil Aeronautics Board has announced that no increase in allowable loads will be permitted on transport aircraft presently flown on United States commercial airlines. The Board disapproved a proposal that such an increase be authorized, following several months of consideration and a public hearing. The maximum landing and take-off weights permitted by the Board under existing Civil Air Regulations for Douglas DC-3 commercial transports are 24,400 pounds and 25,200 pounds respectively.

City Air-Bus Lines Predicted

Arthur Middleton Hill, president of the Atlantic Greyhound Corporation, has predicted that helicopters will supplement the services of inter-city bus lines. In an address before the Institute of Transportation at its recent meeting in the Hotel Waldorf-Astoria, Mr. Hill declared:

"Leaders of the bus industry who have conferred with aircraft manufacturers licensed to build helicopters, and have witnessed demonstrations are fully convinced that these aircraft are the means through which post-war co-ordination of bus and air transportation will become a reality; a gigantic stride in transportation progress, which will give to the public even in the smallest communities the advantage of direct air transportation facilities."

The proposed helicopter-bus service, Mr. Hill emphasized, would not compete with existing air lines and that in many ways it could not be anything but inferior to the regular air lines which would always remain superior in the matter of speed in covering long distances.

New Custom House Guide Now Being Distributed

The 1944 edition of Custom House Guide, which is now in its 83d year, is currently being distributed to importers, exporters, shippers and freight forwarders, John F. Budd, publisher, has announced.

During the past year, revisions in the annual guide have been unusually heavy, Mr. Budd explained, adding that several trade agreements have changed the rates of duty in the alphabetical index of 30,000 commodities. The new guide also contains the shipping and commerce regulations in a section devoted to the Customs Regulations of 1943. New alterations to the Internal Revenue Code, attributable to war legislation and regulations, have also been included.

"This is the year to plan for foreign trade," Mr. Budd declared in making the announcement, "therefore it is not premature to begin planning for the post-war years—years which should bring foreign trade to a position of importance in the United States it has never before enjoyed. Our greatest hope of being able to sustain the American economy of the future lies in foreign trade that is not merely revived to pre-war levels, but is pushed far beyond the brightest pre-war highmarks."



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*Wartime Experience Points To Many
New Techniques Which Will Be Essential;
Sprayed Plastics A Tremendous Factor*

By LYLE C. RAY

*Vice President, Aviation Packaging Co.
Newark Army Air Base*

PREWAR methods of packaging freight and express for shipment will become as obsolete as the heavy alligator luggage of a decade ago when the real age of shipping-by-air comes into its own after the war. But much of the planning for this new age of packaging must be done now, if we are to be ready—as we must be ready—for the greatest period of mass shipping, both by ship and by air, that the world has ever known.

I find, in discussing postwar freight problems with many shippers, that there is a serious danger of underestimating the real future which air shipping will soon be realizing. Far too many shippers discuss rates, weight differences—comparing air to ship cargo—and come up with the conclusion that it just isn't in the cards for cargo-by-air to amount to very much once the pressure of military necessity relaxes and air-vs.-ship returns to its old-time competition on the basis of cost.

But such thinkers lose sight of the fact that all postwar freight will be at a premium—the premium of prompt and speedy delivery. What happened after World War I in the way of suddenly increased foreign demand for U. S. goods won't hold a candle to what we'll see after the next armistice. Then, only a relatively small part of the world had suffered the kind of battle damage and exhaustion of inventories which is characteristic of almost half the globe today. It should be apparent to all that the reconstruction after World War II will require, for several years at least, the fastest possible delivery of countless vital essentials to enable the warring countries to start regaining their commercial equilibrium.

In such a period, packaging will assume

far greater importance than ever before. No longer will it be satisfactory to design shipping containers on a basis of strength alone. Weight becomes for the first time a primary factor if not the most important of all factors in container design. The day of the packaging engineer is approaching.

Just as lightweight, so-called "airplane" luggage has replaced the heavy alligator bag for passenger use not only in the air but in all modes of travel, so the changes in the packaging of freight for air shipment are bound to exert a powerful influence on the packaging of all freight, moved by whatever means.

Some of the most valuable of all our wartime lessons in freight packaging have come as a result of the necessity of packing thousands of planes for shipment abroad — the thousands which for many reasons could not (as the largest bombers usually are) be flown under their own power to their destination. True, these planes have not been shipped by air. But the job of engineering their proper packaging has fathered many a new technique which will be applied to both air and ship cargoes in the postwar period.

What we have learned about shipping from studying transportation of planes

will be invaluable to us after the war when we begin to send equipment for the building of dams in Africa; when we load vessels with motors to be used in the Andes; when we ship machinery to the Arctic, or prefabricated houses to some outlying territory, or radios and television sets to Rio. These are some of the many things manufacturers will have to consider in a post-war world in which intercontinental transportation will play so great a part.

At the beginning of the war, manufacturers of planes attempted to do their own packing of planes which could not be ferried to their destinations. But these companies had neither the time nor the facilities to do a proper packing job. They, therefore, turned the problem over to the Army Air Forces. But the Army had no packaging facilities for such cargo either. So those responsible for the shipment of airplanes sought civilian contractors who could take over the job.

As a result, a new and highly specialized industry has come into existence, and it now is working in many cases 24 hours a day, seven days a week.

The steps through which the average plane passes before being released by

AAF inspectors for overseas shipment include inspection by Army engineers; disassembly and processing of engine; treatment of armament by Army; engineering of box by contractor; crating of fuselage, wings, tail and aileron surfaces; painting and stenciling of box indicating destination; delivery to shipside.

Wings are removed in part—or entirely, if one unit—together with the undercarriage, rudder and tail surfaces. Special jigs are used to support the plane during this process and extreme care has to be taken to prevent tipping over as the center of gravity continues to move about with each part dismantled. In many instances, the entire engine is removed from its mountings and supported separately in the crate. All control wires are properly secured and tagged for reassembly and other parts carefully protected. The plane is now ready for its final treatment before being packaged.

A special taping crew next applies strong adhesive tape to all open seams, wing butts and other apertures to prevent damp air entering. Again silica gel bags are placed throughout the fuselage and cockpit to absorb moisture from condensa-



READY TO SAIL—Modern-day methods of packaging aircraft for shipment overseas are highly specialized. Shown above is the fuselage of a plane ready to be crated. As an additional precaution against the elements the body is sprayed with a cellophane-like substance, taped and plugged to prevent damage.

tion. Canvas covers are lashed over the engines, super-chargers and other vulnerable parts, and the cockpit hatches are sealed with waterproof paper and taped.

These canvas covers are custom-made, many of them are closed with zippers. The weatherproof covers are tailored in the same way slip covers are made for chairs, couches, or other household furniture.

The plane is then placed in its package or box. The weight of these boxes varies from five to twelve tons. These huge containers are bolted and lagged together and generally constructed in a manner far superior to the care used in building the average small house. In fact, little would have to be added in order to make one of these boxes habitable, the interior walls being lined with waterproof paper and the roof being of the heaviest of roof material, tarred and sealed at each and every joint. Reports have come back of both natives and soldiers using these boxes as living quarters. All crates are mounted on reinforced 4" x 6" timber skids in order that they may be dragged along the ground if other means of transportation cannot be obtained.

The waterproof paper which is used on the planes as lining for the boxes is a combination of kraft, leadfoil and asphalt. It is the same type of waterproof paper as that used by the army and the navy for the protection of various kinds of equipment and materials.

Considerable engineering is employed in designing the box for each particular type of plane and no small part of the problem is the designing of special iron stands from which the heavy fuselage is supported, its weight frequently running up to 10,000 lbs. It is interesting to note that these iron supports are so designed that should there be any deflection in the box itself, caused by careless handling or rough seas, their flexible construction offsets any damaging strain that might otherwise be transferred to the fuselage. To the layman, the interior of these packages gives the appearance of a Rube Goldberg setup, the plane having been reduced to so many different parts supported by various contours, irons and special boxes, that it ceases to have the appearance of anything practical. Each packing device, however, serves its own purpose and all forms are carefully padded and covered with wax paper to prevent abrasion. Ventilating

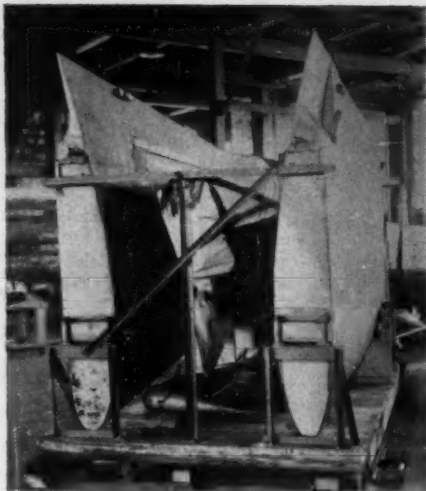
ports and doors are provided for interior inspections by government inspectors before the final shipping release is given. These doors are also for access during the voyage, should occasion arise.

Exposed deck loading is rapidly becoming the popular way of shipping airplanes practically in one piece. Only wing tips, propellers, rudders, elevators are removed and packed in small boxes for below deck storage while the plane itself, properly protected is lashed to the deck. Special "mechano" decks have been constructed on all overseas tankers to take this new cargo in addition to oil and gasoline.

With the increased amount of deck loading of airplanes to all parts of the globe under varying weather conditions, it became necessary to develop a protective coating against corrosion which could be applied and removed with a minimum of man hours. After extensive experimentation, a liquid plastic has been developed known as "Plastiphane." This material is sprayed over the entire airplane sealing every possible opening with a solid film coating which is non-porous, moisture and fire-resistant with a long-life elasticity which permits the expansion of the plane due to extreme heat.

Heretofore unsolved packaging problems are now being rapidly solved, and the post-war shipping era can well be expected to develop a multitude of further uses for plastic coatings.

All forms of protective coverings will have been improved to such a degree that no freight will need to suffer even though exposed to all kinds of weather. Methods of carrying freight, such as an exposed airplane reflect progress. It was not thought that once they were built that there would be any need to disassemble them for shipment, certainly not for shipment other than under ideal conditions. Now these planes must be sent to the four corners of the earth and they have to get there in the best of shape. In one instance that occurred recently, the packing company was sent a commercial passenger plane which the army had taken over to serve a special transportation purpose. The wings had been built to stay put, not to be taken off and replaced. But they had to be taken off, if the plane was to be shipped overseas. They were taken off, which completely changed the balance of the plane. Engineers of the company studied the problem and began to



PACKAGING—The wings of an airplane destined for a foreign battle-front are removed and packaged separately before shipment overseas.

device supports and a housing that would maintain the balance of the body of the plane no matter how rough treatment it might get. Supports were not rigid, they allowed the body of the plane to be suspended and supported in a kind of elastic framework. Then the plane was placed in a huge crate, the construction of which was not unlike that of a wooden house. Inside the house, the plane was held very like the yolk in an egg. It was in balance whether the box was tossed on one side, up-ended or thrown about at a number of angles. If the metal and wooden structures which had been built were entirely rigid, the plane could easily be twisted so that it could not be used without repairs.

All this may well teach packers a great deal about the shipment of automobiles during the postwar period. Shippers will have learned that a piece of machinery or equipment kept rigid in its box does not insure at all that it will arrive at its destination undamaged, even though the container may remain in perfect condition. Delicate mechanisms require packaging that keeps them in balance at all times.

Methods of packing goods on decks, gondolas and flat-cars will have been perfected. We will have learned how to wrap properly. We will know how to protect goods through all kinds of exposure in the most efficient manner.

Four More Lines In Air Link To Boston

Another forward step in the development of open competition in the domestic air transport system of the United States has just been taken by the Civil Aeronautics Board which granted certificates to four more airlines to operate into Boston from the west and south, two from New York.

In its decision, the Board gave permission to Northeast Airlines, which heretofore has operated mainly north of Boston, to maintain a route between New York and Boston; and granted Eastern Airlines permission to serve the New England metropolis only with flights originating or terminating at places south of Richmond, Va., or west of Charleston, W. Va. Boston is now served from the south by American Airlines, and from the north by Northeast Airlines.

The lines and the routes granted follow:

NORTHEAST AIRLINES, INC., to operate between Boston and the intermediate points Worcester, Waterbury, New Bedford, Fall River, Mass., and the co-terminal points New York and Newark, to be known as route number 65.

UNITED AIRLINES, INC., to operate between Cleveland and Boston, with Hartford as the intermediate point on a route to be known as number 66.

TRANSCONTINENTAL & WESTERN AIR, INC., to operate between Pittsburgh and the intermediate points Williamsport, Pa., Binghamton and Albany, N. Y., and Boston, over a route to be known as No. 67.

EASTERN AIRLINES, INC., to designate Boston as the terminal point on its route No. 5, originating in San Antonio, Tex., and its route No. 6, originating in Miami, Fla., with the condition that Boston shall be served by Eastern only in flights originating or terminating south of Richmond, Va., or west of Charleston, W. Va. At present Eastern's routes Nos. 5 and 6 terminate at New York.

Four other applications for routes between Boston and New York were denied. They were filed by Seaboard Airways, Inc., Colonial Airlines, Inc., United Airlines and TWA, the latter two seeking to extend their lines from Boston to New York.

Alaskan Airway Proposed

A proposed new Alaskan airway, to link the frozen north with its Pacific Coast system, is being sought by United Air Lines in an application filed recently with the Civil Aeronautics Board. The application seeks a route from Seattle to Ketchikan, Juneau, Yakutat and Anchorage, Alaska, and a linking of these cities by direct air passenger-mail-express schedules.

The airway proposed by United is approximately 1,600 miles long, and is said by company officials to be in line with their belief in Alaska's present and post-war possibilities.

Air Express Will Be Preferred For Shipment of Goods, Pogue Says

A prediction that air express will become the preferred means for the shipment of goods, is contained in a statement by L. Welch Pogue, chairman of the Civil Aeronautics Board, which was issued in connection with the recent celebration of National Foreign Trade Week, May 21-27. Chairman Pogue's statement follows:

"Today, with one of the finest systems of air transportation in the world operating within the United States, aviation is looking ahead to the world-wide expansion in trade and travel by air that is coming. Today we know that in the United States only a fraction of one per cent of all people traveling on common carriers use an airplane. Today, we are at the threshold of a new era in transportation, and its horizon is unlimited.

"As our domestic air transportation expands to cover both large and small cities and communities of our nation, we naturally look outward to the development of our foreign commerce by air. Aviation has conquered time and distance; no shore line stops it, no mountain stands above it. It flies the shortest, straightest course through the ocean of air which surrounds the world and its speed dwarfs the size of the globe itself.

"New inventions and devices used in aviation in war will be applied to the development of aviation in peace. Travel by air for any substantial distance will come to be the preferred means of common travel in the United States and as the rates go down that volume of travel will increase. The same is true of air express, while in the air mail field it would seem that all first-class mail will eventually be sent by air.

"Aviation is not going to eliminate the railroad and the steamship and the automobile as some extremists would have us believe. Like all previous methods of transportation which have been better and faster than those preceding them, aviation will take some of the business from surface carriers but only that which it can best handle. It undoubtedly will develop important trade and travel that did not exist before, but in the commerce of a world at peace there is room for all types of transportation. Let us recognize also that aviation in peace offers to us the greatest opportunity in history for the creation of unity in the development of a closely related business and cultural world. Let us have the vision to let these wings over the world be the wings of peace tomorrow.

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Air Transportation in Latin America Grows in Volume; Cargo Traffic High

The growth of air transportation in Latin America is reflected in statistical excerpts from a confidential survey of air transportation in that region just released by the American Republics Aviation Division of the Defense Supplies Corporation.

As an indication of that growth the survey notes that the total ton-miles in 1943 was in excess of the estimated total traffic carried by all European airlines, including their overseas routes to all parts of the world in 1938, the last pre-war year.

The total volume of traffic, local and non-local, in and to Latin America, the survey shows, increased from 20,544,000 ton-miles in 1940 to 61,919,000 ton-miles in 1943, and amounted to 29 per cent of the United States domestic traffic in the latter year. Passenger traffic represented 76 per cent of the total in 1943, cargo 18 per cent, and mail only 6 per cent, as compared with 76 per cent, 7 per cent, and 17 per cent, respectively, on the United States domestic system, the relative importance of cargo and mail being reversed.

In certain countries cargo ranked with or ahead of passenger traffic in volume. Cargo accounted for 60 per cent of total ton-miles in Central America; 44 per cent in Bolivia; 33 per cent in Colombia; and 28 per cent in Peru.

Route miles in Latin America, the survey disclosed, are almost three times as great as in the United States, but only half as many miles were flown in 1943. The average frequency of service, therefore, was only about one-sixth as high as in the United States.

Average passenger fares in Latin America are some 40 per cent above the level of the United States domestic system, although a slight decrease has been noted since 1940. Tariffs vary from 3.8 cents per passenger-mile

in Peru to 16 cents in Venezuela. Cargo tariffs averaged 84.6 cents per ton-mile in 1943, a moderate increase over 1940, accounted for principally by substantial increases in Bolivia and Central America. Peru and Brazil had the lowest cargo tariffs in 1943.

Despite substantial improvement since 1940, utilization of aircraft in Latin America is low, the survey shows. A total of 386 planes were in operation in Latin America in 1943, and of this total only 57 were United States flag aircraft. There were 246 multi-engined planes, but only 97 were of the modern types manufactured since 1936.

The number of multi-engined planes of United States' manufacture, owned by foreign-flag carriers in South America, increased from 43 in 1940 to 74 in 1943, while those of German manufacture decreased from 38 to 29. This change was one of the results of the "de-Germanization" program, which has been carried out by the Defense Supplies Corporation and the Department of State, in cooperation with the countries of South America.

The survey was initiated by Stokeley W. Morgan, chief of the Aviation Division of the Department of State.

Pan Am's Summer Service

Summer service across the North Atlantic was reopened last month by the ocean-flying clippers of Pan American Airways. Touching at Canadian and Newfoundland ports on their flights from New York to the British Isles, the clippers will carry regularly scheduled mail, passengers and express.



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New Diesel Engine Offers Safe, Economic Plane Operation

Guiberson Radial Diesel Consumes Less Fuel, Eliminates Fire Hazard, Self-Induced Radio Interference

By MAJOR MIGUEL RAVINOVITCH
Guiberson Diesel Engine Company

IN Dallas, Texas, the 25-year-old Guiberson Diesel Engine Company is hard at work producing new and unique aviation diesel engines, designed to propel the plane of tomorrow, and aid air transportation in an aggressive competition with cheaper forms of surface transportation.

The engine, the only one of its kind in the United States, is a product of more than fifteen years of experience in engine building and advances in aeromotive engineering, combining low operating cost, dependability, high efficiency and low installation and maintenance costs. Add to this simplicity of operation, the elimination of self-induced radio interference from high tension ignition systems, safety from fire, and freedom from troublesome and dangerous icing of the air induction system that is prevalent in engines using carburetors, and you have at least a thumbnail picture of an engine that does away with the need for using costly high-fractionated gasolines.

Developed by Allen Guiberson, head of the company, the engine is known as Model A-1020. The engine also holds Civil Aeronautics Authority Approved Type Certificate No. 220, and has given extraordinary satisfaction in flights made by the firm's Stinson plane.

The new Guiberson engine is a nine-cylinder, single-row, four-cycle, direct-injection, radial air-cooled diesel aircraft engine, developing 310 horsepower. With its unique fuel-injection system, complete exhaust scavenging and high volumetric

efficiency, it gives extremely low fuel consumption. Gasoline engines of equivalent power rating use 28.5 per cent more fuel than the Guiberson. It also averages 30 per cent greater operating range per pound of fuel. The low fuel consumption, plus the low cost of diesel fuel reduces the operating cost of the engine to a fraction of the cost of other engines.

To give an idea of comparative estimates, the following has been prepared:

Fuel Cost Per Long Ton Statute Mile			
Flight from Dallas to:	Miles	Guiberson Diesel Engine A-1020	Conventional Gasoline Engine
New York.....	1370	\$22.26	\$126.03
Washington.....	1180	19.18	108.55
Los Angeles.....	1239	20.13	113.98
Mexico City.....	934	15.18	85.92
Guatemala.....	1315	21.37	120.97
Cristobal.....	1945	31.61	178.92
Havana.....	1102	17.91	101.37
Bogota.....	2437	39.60	224.18
Caracas.....	2442	39.68	224.64
Quito.....	2573	41.81	236.69
Lima.....	3360	54.60	309.09
La Paz.....	3896	63.31	358.39
Santiago.....	4880	79.30	448.91
Buenos Aires.....	5280	85.80	485.71
Montevideo.....	5365	87.18	493.53
Asuncion.....	4766	77.45	438.42
Rio De Janeiro..	5220	87.83	480.19

Although the radial, air-cooled diesel was developed primarily as an aircraft



The Writer

Major Miguel Ravinovitch was born in Russia, and attended schools in St. Petersburg. He continued his education in Germany, France and England, studying engineering at the Ecole Central in Paris. After his graduation he enlisted in the French Air Corps and was commissioned in 1923. After travels in South American he returned in 1932 to France to fly from Dakar to Natal thus aiding in the establishment of the first airline across the South Atlantic. He returned again to France for a post with the League of Nations. In 1935 he took part in a Colombian and Peruvian incident at Laticia in South America, and maintained residence in and out of Colombia, his adopted country, since that time.

engine, large numbers of them have been installed in light tanks and have written a story of service and dependability on the battlefronts of the world. Today, several hundred of these engines are back in Dallas for modification so that they may again return to the battlefront as power plants for amphibian tanks and cargo carriers for the United States Navy.

Due to the instantaneous response to the throttle — a characteristic of high-speed diesels—even under extreme temperature conditions, the A-1020 air-cooled radial can take full throttle with exceptional speed without danger or damage to the engine. Forged pistons, forged cylinder barrels with integral cooling fins, polished link rods and precision-built injection system insure long service life.

Operating at relatively low temperatures because of the inherently high thermal efficiency of the diesel cycle, the A-1020 holds down wear on exhaust valves and seats. The Guiberson Injector Nozzle has operated satisfactorily without adjustment for more than 1,000 hours of operation.

The Guiberson A-1020 engine develops more power at the higher altitudes than gasoline engines of equivalent sea-level power rating. A gasoline engine reaches its ceiling when the air becomes so thin that it contains only enough oxygen to maintain engine power for the ship at that altitude. The Guiberson aviation diesel engine at the same altitude will produce sufficient power for the plane to continue to climb. Actual high altitude flights have proven the service ceiling of a Guiberson-power ship is considerably higher than that of equivalent gasoline-powered planes.

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IT'S AN WORLD

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By L. A. GOLDSMITH, *Economic Analyst*, AIR TRANSPORTATION

DURING the two meetings of the Inter-American Development Conference, recently held in New York, matters of paramount importance were discussed and commercial and industrial plans laid down for development in the post-war period. Air transportation came in for

United Aircraft's Eugene Wilson Says Expanded Air Transportation Of Profound Importance to All

a share of the discussion but it was not unduly highlighted, although its value was fully recognized. One of the most vital talks was given by Eugene E. Wilson, Vice Chairman of the United Aircraft Corporation, at a luncheon of the National Association of Manufacturers, to the delegates of the Inter-American Development Commission. It was one of the shortest, but also one of the soundest talks heard at the Conference, and very slight reference was made to it in the press.

The meat of Mr. Wilson's thought was summed up concisely in his two last sentences: "The history and progress of mankind has paralleled the development of transport. Expanded air transport may become the catalyst of a new and dynamic era of peace and prosperity of profound importance to Americans—in fact to the world." He further emphasized the point that there is a distinct analogy between air power and sea power, and that "the nation which maintains the dominant Air Power in the period to come can keep the peace and promote the prosperity of the world."

"With the rise of air power," Mr. Wilson pointed out, "the term air power involves a wider connotation than the usual one because this like sea power also encompasses five elements—air forces—air transport—air bases—air productive capacity—and air mindedness."

This factor of air mindedness is perhaps the most vital of all. Because *unless there is a constantly developing air minded public, no aircraft industry can be utilized at its highest productive capacity.* Furthermore, as a logical sequence, air transportation will not be evaluated at its highest level of profitable usefulness, unless a growing air mindedness is carefully nourished. Neither can the over-all development of air commerce flourish under its own impetus, if its vitalizing influence on the potentialities of *all* phases of industry, business, transportation and every day living conditions is not strengthened and its pace accelerated.

BUT how to develop this growth of air mindedness? Well the war news with the almost fantastic figures of airborne troops, and the thousands and thousands of sorties of air armadas bring it home to us on the front pages of the newspapers every day. But the horrors

New Concept of Geography A "Must" for Global Air Age And Increase of Airmindedness

of war tend to bring about a revulsion of feeling to people sorrowed by personal losses and depressed by nerve strain and tension. More prosaic means will have to be discovered to keep the wonders of aviation in every day life before the public. Superimposed on the wounds of war, people must be shown the potentials of peace and future prosperity for them and their children. It is none too soon to use the psychological approach of positive benefits to be derived from aviation for peace, even though some of these are born of the ravages of war.

A few days ago I was in the office of a busy aviation executive. He, together with some of his colleagues were about to leave for an important business conference in another city. Added to their "working tools" of facts and figures prepared for this meeting, I was interested to see a new "Atlas of Global Geography." They considered this a "must" to take along with them. Curious to know what this Global Geography contained I glanced over it, and did not rest until I had one of these books in my possession. I would consider this "Atlas of

Global Geography" as No. 1 on any preparation list for the development of air mindedness. It is a unique and distinctive approach to Global Geography written especially for the Air Age. Its Author is Erwin Raisz, Lecturer in Cartography at the Institute of Geographical Exploration, Harvard University. This Atlas does not just contain maps drawn in oblique orthographic projections for a "plane's eye view." That is nothing new. The value of this Global Geography is its graphic pictorial approach to other factors in world conditions. These cover obstacles, problems, difficulties which can be and will be met by means of aviation and air transportation.

The text as well as the pictorial presentations and maps are excellent and should be productive and profitable for an infinite variety of people.

For practical Air Cargo planners there are tables showing the comparative carrying capacity of ocean going surface carriers versus trains and cargo planes, taking into account the time factor. Historical and economic backgrounds of inestimable value in charting sales plans in various markets are shown up in a most practical and attractive easy-to-understand method.

AS Air Mindedness seems to have become the theme for this entire column here is still another phase of that subject which came to life during Foreign Trade week the last week of May. A most interesting exhibit of High School Students' scrapbooks were on display at the Hotel Astor where the Annual World

High School Students' Scrapbooks Promote World Trade Knowledge As Well As Airmindedness

Trade Luncheon of Foreign Trade Week was held. These scrapbooks were started as the result of a suggestion from the Foreign Trade Week Chairman of the Educational Committee. A number of High Schools and students received individual credits in their Economic Geography classes for the work done on the Scrapbooks. The objective was to show up the importance of the relationships of world trade. All the books were interesting and some of them were outstanding. The boys and girls went to all sorts of trouble and effort in making up these books and there was evidence of originality and intelligence in all of them. Some of them were developed with special ingenuity and in all cases showed a surprising understanding of the importance of world trade to our daily living conditions. A great proportion of the items selected to go into these scrapbooks were in connection with air travel and air transportation. Aviation undoubtedly makes an appeal to the youth of the nation.

The Stars and Stripes flew proudly from the front page of one of the most excellent of the scrapbooks. The Flag stood out, as not even the most beautiful cover girl could have done. "Tying the World Together" was the title of another scrapbook. Some of the students worked together on the scrapbooks as class projects and developed them collectively. One of the boys had a special sample page of exports and imports. He had obtained minute items of real products and merchandise used in world trade and had attached these with appropriate comments to the scrapbook. The boys and girls all seemed to have had genuine fun in creating these books, and they all agreed enthusiastically that the work was stimulating and informative. They understood the fundamentals of the subject very well, and it looks as if the next generation stepping along is not only going to be world trade-minded but also very *air minded*. So page the air lines—these young people are certainly going to be good prospects for passengers along the expanded air travel routes of the coming post-war period.

Delta Mail, Freight Up

Delta Air Lines of Atlanta, Ga., carried a total of 389,732,514 mail pound miles during the first three months of this year, as against 266,432,889 for the same period last year, indicating an increase of 46.3 per cent. Express pound miles this year totaled 58,619,360, as compared with 45,555,799 in 1943, an increase of 28.7 per cent.

Braniff To Serve Lubbock

An application to serve Lubbock, Texas, on the Dallas-Amarillo-Denver route now flown by Braniff Airways, Inc., has been granted by the Civil Aeronautics Board. Lubbock will now receive direct service to and from the Dallas-Fort Worth area, and will thus be connected with the remainder of the Braniff system.

Air Cargo Rate Reduction Of 60% After War Seen By M. D. Miller of AA

A reduction in air cargo rates of as much as 60 per cent under current tariffs is a post-war possibility when transportation by air begins to reach its own level, according to M. D. Miller, cargo traffic manager of American Airlines, Inc.

Mr. Miller said he could not see rates going much lower than that for some time to come in spite of the estimates and predictions of persons whom he said had not the practical experience with air cargo to make their conclusions sound.

Discussing the benefits that will accrue to the shipper from air cargo, Mr. Miller cited the fact that it will be necessary to tie up less capital in inventories and that such capital will thus be made available for other uses; that less time will be required for goods in transit thus bringing a quicker return on investment; that the need for warehousing will diminish; that extensive refrigeration will not be necessary; and that as it applies to foreign trade, the costs and operations of transshipment will be removed.

The industry, Mr. Miller added, is currently hampered from expanding by a shortage of planes and its inability to stabilize rates.

Mr. Miller contends that the real future of air cargo transport remains to be seen since no one can predict future expansion. Thus far, he added, it has been tested only by the war. He maintained that air cargo would not take the place of rail, water or motor transport, but would create a traffic of its own. Air cargo transport, he continued, will have to prove its economic usefulness for the commodities it intends to carry since it will be used by a shipper only when it can make money for him.

An important development of air cargo transport, Mr. Miller pointed out, will be the development and introduction of new and more economic methods of packaging.

Canadian Pacific Passenger Traffic Up, Freight Down

Canadian Pacific Airlines, in the first four months of 1944, carried a total of 31,833 passengers, an increase of 75 per cent over the same period last year, according to a traffic report released recently in Montreal. Goods carried totaled 3,159,459 pounds, representing a decrease of 11 per cent, and mail carried amounted to 619,140 pounds or a decrease of 27 per cent compared to last year. Passenger miles flown increased 74 per cent, but mail pounds flown dropped 15 per cent.

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TO Jack Stanley, Arthur Hazen and Frank LeMasters, mechanics for Pennsylvania-Central Airlines at the Detroit Municipal Airport, who have been commended by General Henry H. (Hap) Arnold for their courageous action in saving an Army bomber from destruction by fire several months ago.

The Army ship was endangered by flames from a smaller plane which was struck by the ground looping bomber. Fearing an explosion in the bomber's tanks, the three mechanics disregarded their own safety, ran to the scene and fought the blaze at close range with fire extinguishers.

General Arnold, in his commendation, declared, "Your efficient and courageous conduct on this occasion not only serves as a splendid example of effective civilian participation in the war, but is deserving the gratitude of your government whose appreciation I take pleasure in expressing to you."

TO Erle M. Constable upon his appointment as Assistant Treasurer of Taca Airways, S. A., and Taca Airways Agency, Inc. A former statistician and budget officer with Transcontinental & Western Air, Inc., Mr. Constable was executive assistant under the executive vice-president prior to joining Taca.

Mr. Constable was loaned to Taca shortly after TWA purchased an interest in the former airline to make a survey of accounting procedures and handlings in Latin America. Upon completing the assignment he returned to the United States and was shortly thereafter engaged for his present position. He holds a Master of Arts degree in business administration from the University of Nebraska.



Erle M. Constable

TO Mrs. Bernice Ann Verhoye of Flushing, Queens, who has the unique distinction of being the first and only woman in American

Airlines, Inc. ever to earn a CAB license as aircraft engine mechanic. Mrs. Verhoye earned her license after a year and a half of hard work in school and AA shops where she dismantled and reassembled an aircraft engine with the aplomb of a professional engineer; and after successfully passing a stringent CAB examination.

A native of Joliet, Ill., Mrs. Verhoye grew up in an atmosphere of aviation mechanics. For her practical test, Mrs. Verhoye demonstrated for two hours a day on five days that if necessary she could do a one-man job on engine over-haul on a DC-3.

"It isn't hard," says Mrs. Verhoye. "There's just a lot of it."

TO George P. Smith, who has been named general manager of Compania de Aviacion Pan American Argentina, S. A., to replace Sylvester J. Roll. Mr. Smith has been sales manager of the company for the past four years, and at a recent special meeting of the board was named to its membership in place of Mr. Roll.

Born in Brunswick, Ga., Mr. Smith has spent the past twenty years in Latin America, beginning his business career with the United Fruit Company in Central America in 1924.

He joined Panagra in Panama in 1932, and four years later was transferred to that company's South American general office in Lima, Peru, as assistant general sales manager.

He was transferred to Pan American Argentina as sales manager in June, 1940.



George P. Smith

TO S. V. Hall who has been assigned to full-time management of United Air Lines' military operations for the Air Transport Command across the Pacific and to Alaska. Mr. Hall, regional vice-president of United, heretofore has devoted his attention to supervision of both the company's commercial operations west of Denver and its military operations in the Pacific.

O. C. Richerson, who had been Mr. Hall's assistant, will serve as regional manager of western operations for United. Both men have their headquarters at San Francisco.

The appointment of Captain Ralph J. Johnson, veteran UAL pilot, as assistant superintendent of Pacific Flight operations for the company, was also announced. He joined United in 1933 after six years as a pilot for Boeing Air Transport.

TO Walter Sternberg upon his promotion to General Traffic Manager of Eastern Air Lines. Mr. Sternberg joined Eastern Air Transport in December of 1930 as operations and traffic representative at Miami, Fla. Three years later he was transferred to Jacksonville in charge of the traffic offices, remaining in that post until 1937, when he was promoted to District Traffic Manager in Chicago.



Walter Sternberg

In 1940 Mr. Sternberg became Northwestern Division Traffic Manager, and two years later was named assistant to the first vice president with headquarters in New York. In March of last year he was appointed Assistant General Traffic Manager, the post he held prior to his promotion.

TO Hollis R. Thompson, vice-president of American Airlines, Inc., who has been appointed head of the company's route development department. Mr. Thompson, who is also president of American Airlines de Mexico, will have charge of matters pertaining to the company's route planning and development program.

TO Richard S. Husted who has been appointed manager of the Curtiss-Wright Corporation's offices in Washington, D. C. Mr. Husted, who has been service engineer, sales engineer and manager of public relations for the Wright Aeronautical Corporation during the last seven years, has just assumed his new duties. He succeeds S. Paul Johnston, who is now on a leave of absence with the Naval Air Transport Service. Entering aviation as a flying cadet in 1929, he gained experience by rising through the ranks with Pennsylvania Air Lines. He became assistant power plant engineer with the Bureau of Air Commerce, now the Civil Aeronautics Authority, in 1935, and then joined the Wright Corporation. He was born in Watertown, N. Y., and was graduated from Williams College and the Massachusetts Institute of Technology.



Richard S. Husted

TO Alberto Sanchez Llorente who has been appointed assistant treasurer of Aerovias Braniff, S.A., the Mexican airline controlled by T. E. Braniff, president of Braniff Airways. Mr. Sanchez Llorente will be resident executive in charge of accounting and finances in Mexico City under the personal direction of C. G. Adams, treasurer of both companies.

For the last five years Mr. Sanchez Llorente has been treasurer of a large Mexican airline. His association with the aviation industry began fifteen years ago. He is a graduate of the Banking and Commerce School of Mexico City.

TO Alfredo de los Rios, founder of the Inter-American Escadrille and exponent of unification of the Americas through common



Alfredo de los Rios

interest in civilian flying, who has joined the staff of the Fairchild Engine and Airplane Corporation as assistant to A. R. Stocker, director of foreign relations. Mr. de los Rios will be active in the foreign sales division.

Born and educated in Chile, Mr. de los Rios came to the United States in 1919 for work in the export activities of several United States manufacturers. Becoming interested in aviation as an expedient in business travel, he learned to fly in 1926 and soon thereafter devoted his full time to various operational phases of the then rapidly expanding aviation industry.

In 1941, Mr. de los Rios with Major General Frank R. McCoy, president of the Foreign Policy Association, and Walter Bruce Howe, comprised a Civil Air Mission to the American Republics which, with the assistance of the State Department and the Office of Inter-American Affairs, toured every Latin-American country.

TO Harold G. Fitzpatrick on his election as secretary-treasurer of the Jordanoff Aviation Corporation, producers of visual manuals. Mr. Fitzpatrick was formerly controller and acting secretary-treasurer of the company. Before joining the firm in July of last year he was associated with Chase National Bank for seventeen years and had served as assistant manager of the bank's 45th Street Branch from 1942.

TO C. Bedell Monro, president of Pennsylvania-Central Airlines, for dual honors recently bestowed on him. He was awarded the honorary degree of Doctor of Laws by Marietta College in Ohio, and was named to membership in the sub-committee on air transportation of the Illinois Post-War Planning Commission.

Mr. Monro received the degree at annual commencement exercises "in recognition of his many contributions to the development and progress of commercial air transportation." Mr. Monro, who left a professorial berth at the University of Pittsburgh in aviation's pioneering days, also holds degrees from Harvard University and the University of Pittsburgh.

TO Thomas A. Prevost who has been promoted to eastern regional traffic manager for National Airlines, Inc., with headquarters in New York City. Mr. Prevost formerly served National as district traffic manager in New Orleans. Mr. Prevost's elevation to the new post, it was said, was made in connection with the opening of a New York City ticket office in the Airlines Terminal Building.

Mr. Prevost was for six years travel representative in charge of all transportation out of the New Orleans office of the American Express Company, prior to his affiliation with National in January, 1943. John Hughes, formerly New Orleans city traffic manager, has been named to succeed Mr. Prevost in that city.

TO E. E. Wilson, vice-chairman of United Aircraft Corporation, and Donald Douglas, president of Douglas Aircraft Company, on their election as chairman and vice-chairman respectively of the Board of Governors of the Aeronautical Chamber of Commerce of America.

TO Robert C. Hallett upon his appointment as assistant division traffic manager of the Atlantic Division of Pan American Airways with offices at LaGuardia Field. He will assist Division Traffic Manager Phil S. Delany.

Prior to his recent appointment, Mr. Hallett was PAA's senior representative and district traffic manager for the west coast of Africa. He has been replaced at this post by Jesse L. Boynton. William Holcombe, formerly at PAA's Lisbon terminal will take over Boynton's former duties as airport traffic manager.



Robert C. Hallett

TO Cleeman Withers who has been appointed to the general manager's executive staff of the Ranger Aircraft Engines division



Cleeman Withers

of the Fairchild Engine and Airplane Corporation. Mr. Withers is a Lieut.-Comdr. in the United States Naval Reserve, and was graduated from the United States Naval Academy in 1917, serving at sea during the first World War.

Completing advanced studies in engineering and courses in accountancy and law, he became vice-president of the Sperry Gyroscope Company, Inc., after joining the firm as treasurer in 1932. He served United Aircraft Products, Inc., and before joining Ranger was vice-president of the Gray Manufacturing Corporation. He holds membership in numerous engineering groups.

TO J. Nelson Kelly on his appointment as executive vice-president of the Fibre Lock-Nut Corporation. A former pilot and manager

of flying operations, Mr. Kelly earned his wings with the Army in 1917, flying with Colonel N. Jay Boots, president of the corporation.

Mr. Kelly flew air mail when the program was in its embryo stage, was on aeronautics inspector for the Department of Commerce; a test pilot and sales engineer for the Aviation Corporation. He became the first manager of Floyd Bennett and the New York Municipal Airport fields and, at one time was operations manager of Roosevelt Field, L. I.



J. Nelson Kelly

TO Gus Leazar, airport engineer and CAB safety specialist, who has been elected a director and vice-president of Southeastern Air Service, Inc. He will devote his full time to the development of Southeastern's post-war fixed base and feeder airline operations. James V. Carmichael, general counsel for the service, was also named to the board of directors. Mr. Leazar was assistant chief of the Investigation Bureau of the Safety Bureau of the CAB.

Inland Airlines Purchased By Western For \$347,472

The purchase of Inland Airlines by Western Air Lines for a purchase price of \$347,472.73 has been approved by the Civil Aeronautics Board. Marking one of the largest domestic consolidations ever acted upon by the Board, the airline purchase will combine Inland's 1300-mile air network and thirteen-year pioneer background with the border-to-border route of Western, the nation's oldest existing airline.

The purchase price, it was said, covers 137,341 shares representing 83 per cent of the Inland stock at a cost of \$2.53 per share, less certain adjustments to be made in the near future. William A. Coulter, president of Western indicated that his firm would offer holders of the remaining 26,977 shares the same price, bringing the total purchase price of all Inland's stock to \$415,724.54, less certain adjustments.

The purchased air network follows a northerly route from Denver to Casper and Sheridan, Wyoming, to Billings and Lewistown, Montana, and ties in with Western's California-to-Canada trunk line at Great Falls, Montana. From Cheyenne, Inland's route branches north through the Black Hills area

to Scottsbluff, Nebraska; Rapid City, Spearfish, Pierre, and Huron, South Dakota. Although Inland operates the route from Denver to Cheyenne on a temporary certificate, Western will file for a permanent operation between these two cities in the very near future. Inland also has pending before the CAB a route from Denver to Minneapolis.

In their joint opinion approving the purchase, Chairman L. Welch Pogue and Oswald Ryan, member, of the CAB, said in part: "Although the proposed acquisition does not accomplish the desirable end of creating a geographically integrated corporate pattern for Western, other considerations of public interest must be examined and weighed in determining the effect of the proposed acquisition on the public interest. Among the statutory objectives enumerated as being in the public interest is the regulation of air transportation in such a manner as to insure the highest degree of safety and efficiency and the fostering of sound economic conditions in air transportation.

"Evidence submitted in this proceeding shows that Inland's operations procedure and maintenance as well as operating personnel have on occasions failed to measure up to the standards required in the public interest."



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Insurance Company Recognizes Safety In Air Transportation

With the removal of archaic language and clauses from applications, another step forward in insurance company recognition of safety in commercial air transportation was reported recently by Frazier S. Wilson, manager of the insurance department of United Air Lines in Chicago.

The Connecticut General Life Insurance Company, Mr. Wilson said, has adopted a complete change in the language of its application clause referring to flights in scheduled commercial airline operations. He added that a number of other leading insurance companies are expected to follow suit.

In its old application form, Connecticut General asked the prospective policy holder whether he had during the past year taken "an aerial flight as a fare paying passenger on a commercial airline." Also required was additional information as to how many hours and how many ascensions had been made on commercial airlines. This furnished the necessary underwriting data which has now established commercial air travel experience at the same level as ordinary ground carriers.

As a result, Connecticut General, in its new application form, is simply asking whether the applicant has taken or contemplates taking "any aerial flights other than as a passenger on a commercial airline." The new question no longer searches for information concerning commercial air travel, but implies that the actuaries no longer consider such flight an underwriting problem.

Mr. Wilson pointed out that most leading insurance companies long ago waived extra premiums for flights on commercial airlines, thus giving commercial air transportation the same recognition as that accorded surface carriers. Insurance underwriters, at the same time, have made available air travel policies at rates equivalent to those charged on policies covering surface transportation.

"The new step by Connecticut General," Mr. Wilson said, "further tends to eliminate obsolete policies and practices on the subject of insurance as it applies to air travel—policies and practices which had their inception in the pioneering days of air transportation."

TWA Files For Worldwide Route

Transcontinental & Western Air, Inc., has just become the first airline to seek a round-the-world route by filing an application with the Civil Aeronautics Board to extend its services 20,000 miles, and bringing any point in its proposed world system to within thirty-eight hours of the United States.

In its application, TWA proposed service from Seattle, San Francisco, Chicago, Detroit, Washington, New York and Boston to ten foreign "key traffic areas in which this country has strong commercial, diplomatic and national defense interests." It was the first time in the history of the CAB that traffic generating areas, instead of individual cities, were used as the basis of a new route application.

Jack Frye, TWA president, said the Lockheed Constellation in which he and Howard Hughes flew from Los Angeles to Washington in the record time of 6 hours and 57 minutes, would be used for such a service.

An alternate route includes Alaskan and Asiatic cities.

Plans to "Sell" Air Travel To the Feminine Traveler

What women's attitude will be toward flying and air travel when accommodations are generally available is the subject of a study that has just been undertaken by the Air Transport Association's office of Public Information in New York City.

Believing that one of the problems which the airlines face when post-war travel is resumed and which they are now making plans to overcome is the element of fear, either by the potential traveler or by his family, the lines feel that putting across the idea that the plane is a safe mode of conveyance will be their chief selling problem.

A large number of women, it was reported, are being asked whether they themselves will fly after the war, and also whether they will have objections to such travel by the men in their families. The women are also being asked to suggest any improvements in service or equipment which would make flying more pleasant for the feminine traveler.



REWARD — Kinsey N. Merritt, right general manager of public relations, Railway Express Agency, receives the Dartnell Service gold medal award for excellence in business letter writing, from Gene Flack, first vice president of the Sales Executive Club, New York. The award was made for a letter mailed to 50,000 air express prospects, and brought a 34.8 per cent return.

New Line Operating In Oklahoma

A new Oklahoma airline company, Central Airlines, Inc., has been organized in Oklahoma City, and has just begun an intra-state, non-scheduled service between Oklahoma City, Duncan and Lawton. The \$100,000 corporation is the first of its kind in the southwest and will transport passengers on a contract basis.

President of the new airline company is Guy O. Marchant, while Keith Kahle, an aviation writer for the *Daily Oklahoman*, is founder, general manager and vice-president. L. L. McMillon is chief pilot and operations manager, and Edwin K. Cornish is traffic manager.

The new airline company has filed an application with the Civil Aeronautics Board for a permanent certificate of convenience and necessity, to carry mail, passengers and property on scheduled, inter-state service.

Athens, O., Added To Service

All American Aviation, organized five years ago as the first scheduled air mail pick-up service, has just obtained authorization to provide this unique service at Athens, Ohio, for mail and express.

Tomorrow's Global Planes

(Continued from Page 33)

When the Mars takes to the air in the post-war period the obvious advantages which a plane of its size and speed offer will soon be recognized. Payloads greater than anything yet carried will be commonplace; and its ability to fly great distances will open up new and exciting markets. Air cargo transportation will become big business when ships like the Mars can and will demonstrate an earning power for shippers.

It is a truism that we must be prepared continually in the air, and it will be the airways of the country that will lead in this respect. The development of the Mars, planned originally as a battleship of the air, together with the engineering research that has gone into its successful construction, is a step in this direction. The United States must not only maintain a large air fleet, but huge aircraft production facilities as well.

Air Commerce can bear a share of the load and contribute to the future of America. The Mars is making its contribution today.

Many today are inclined to think that after the war lethargy will fall on aviation. The world, some of them think, is full of planes for which there is no use. But it is an illusion. Today there are even more men working on the dream of flight than gave it thought ten, twenty or thirty years ago. They are working over the drawing boards and on the fields to build larger, faster and safer planes. They move ahead. The golden age of flying is still to come. It is being ushered in in no small way by ships like the Mars. It spans continents, crosses oceans. Propellers with mighty energy behind them thrust out speed and power. It is bringing a new day to the people of the world. Exotic lands will be our next-door neighbors, and the prosaic food from our breakfast table will grace the tables of South Sea islanders, thanks to the Navy's Old Lady.

A Packaging Miracle Makes Planes Immune to Wind, Weather and Water

An American fighter plane came out of the clouds over Newark, N. J., dipped its nose in the direction of the Newark Airport, and soon rolled to a halt at the edge of the landing strip. Skilled hands took the plane in tow and prepared it for the miracle that is being wrought daily at the field which is now the headquarters for the Atlantic Overseas Air Service Command.

It is a miracle of packaging—prosaic sealing and wrapping of planes and parts of planes to get them to the fighting fronts in working order. Brig. Gen. William E. Farthing commands the AOASC, and is responsible for the shipping by boat of all planes from East and Gulf Coast ports.

The planes are first checked in repair shops, and then turned over to one of two civilian contractors located at the field. The contractors, Dade Brothers and Aviation Packaging, work on a body basis.

"Planes are built for flying and not for shipment," said General Farthing, "so we must exercise the greatest care in preparing them for their voyage."

Planes slated for places below deck are stripped of wings, propeller, tail assembly and other parts. These are packed carefully and securely in a packing box to prevent separation and loss. The packing boxes or crates, General Farthing said, are in great demand on the other side where soldiers frequently use them for homes.

The system employed in packing the planes sometimes reminds one of an assembly line. Those scheduled for places on deck face removal of their wing tips, propeller and tail assembly by a line of workers that includes persons from all walks of life. Engines, Gen. Farthing said, are "pickled" with a rust preventive to hinder damage by salt water. Chemically treated plugs are inserted through-

out the fuselage, and all cracks and crevices are taped up.

The plane is then sprayed with a protective covering, a black cellophane-like substance which also protects the plane from the erosive powers of the salt water. Easily removable, the film can be stripped from the entire craft in thirty minutes by five men. Lighters take the planes to the ships in the harbor ready for the overseas voyage.

The service does not limit itself to planes, sending gasoline trailer trucks, fuel tanks, engines, rescue boats, mobile repair shops and photographic units, gasoline, oil, radio crystals and other items which are packaged in crates depending on their destination.

Fighter planes are tough, strong instruments of death, but they are also delicate pieces of machinery. They must be made immune to wind, weather and water.

Out of this war-inspired job is expected to come a new technique that might well have a definite and lasting effect on the packaging of the goods of peace that will be borne by air to all parts of the world when the war is over.

Traffic Conference In Denver

The country's leading airline executives will convene in Denver again next month for the annual Air Traffic Conference of America and a discussion of wartime problems, according to Paul J. Carmichael, general traffic and cargo manager of Continental Air Lines. Braniff, Inland, United and Continental will act as joint hosts to the conference which will be held on July 17 and 18. Under consideration, Mr. Carmichael said, will be air tariffs, schedules and related subjects.



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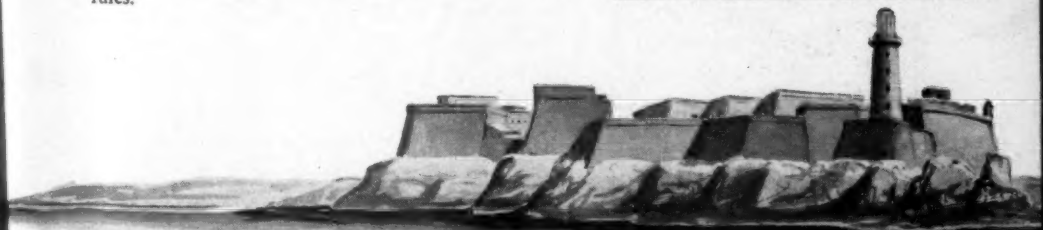
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The new DC-4 express liners, with a cruising speed 50 miles an hour faster than today's standard planes, are expected to clip six hours off coast to coast and even more off foreign air cargo schedules.

TODAY'S all cargo liners are a far cry from the single engined open cockpit bi-planes that pioneered air express sixteen years ago. In those days a coast to coast shipment took more than thirty-six hours instead of overnight.

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